# FEDERAL BOMB INTELLIGENCE

## U.S. GOVERNMENT GUIDE TO TERRORIST EXPLOSIVES

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*Federal Bomb Intelligence:*
*U.S. Government Guide to Terrorist Explosives*

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# ARAB TERRORIST BOMBS AND WEAPONS

**BOMB DEVICES AND WEAPONS USED BY ARAB TERRORIST GROUPS.**

**SOURCE:** Foreign.

Information has recently been obtained about the bomb devices and weapons utilized by Arab terrorist groups in conducting terrorist activities outside the State of Israel. This Special Technician Bulletin (STB) will include descriptions and photographs of these various devices.

The first item is a "taser type" weapon. By pushing one of the two buttons on top of the device it operates as a flashlight. By operating the other button, two electrical darts are fired, releasing a high voltage charge into the target.

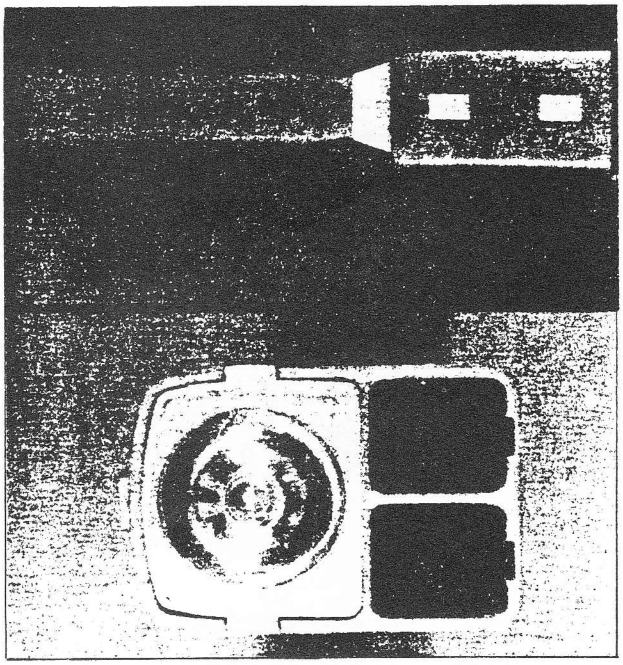


FIGURE I: TASER

A purse is used, as we all know, by most women as a personal accessory. However, it can also be used by terrorists to hide explosives. In fact, some of the Arab terrorist groups use purses as booby traps. A woman's purse is usually left in an office or airport lounge, and when it is opened a spring device is released (the button marked A in the photograph) activating the explosives.

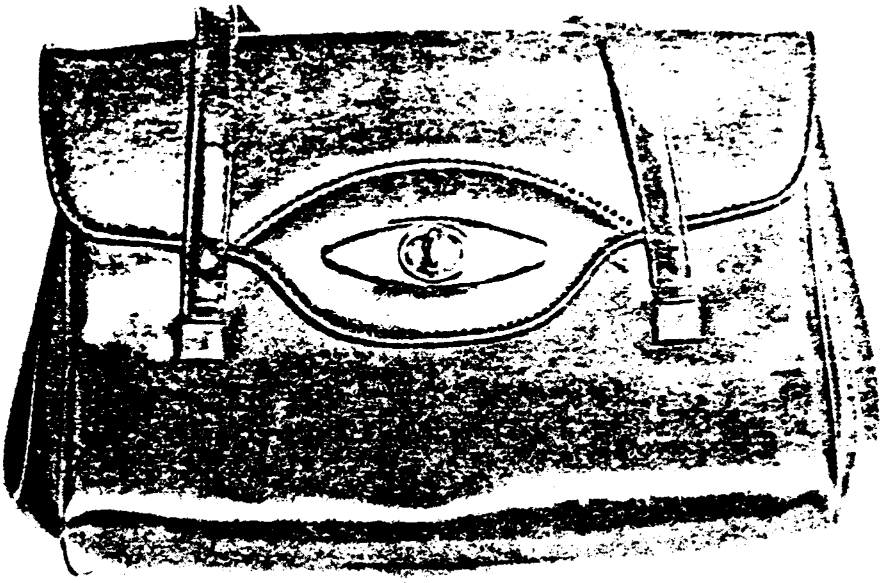


FIGURE 2: PURSE

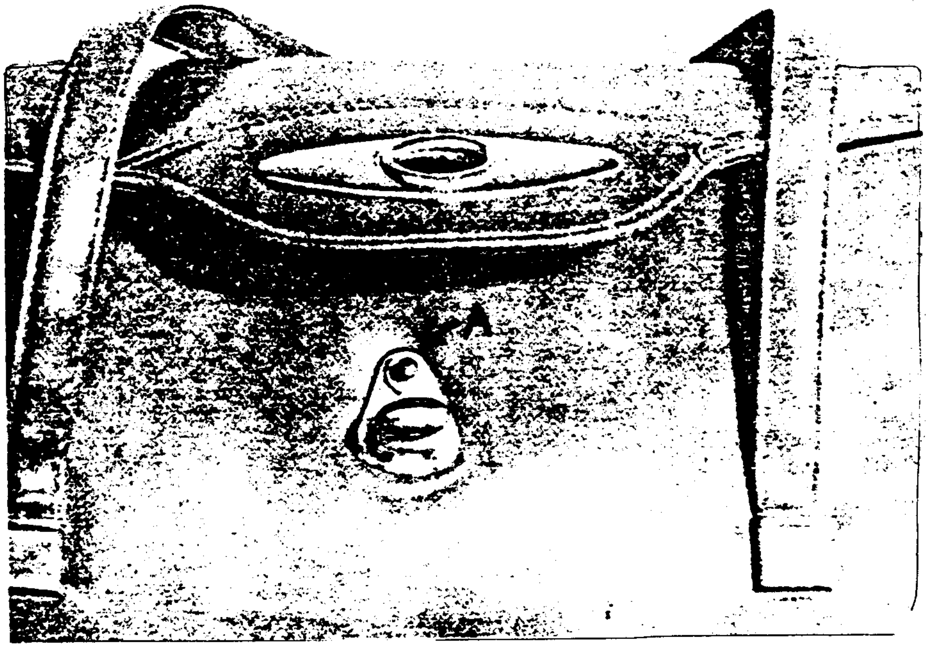


FIGURE 3: LOCK ON PURSE

In all actuality a bomb can be hidden in almost any type of container, bag or package, depending upon its size and weight. The photo below depicts a bomb contained in a "Diet Pepsi" can. It is activated by simply pulling the tab opener on top of the can.

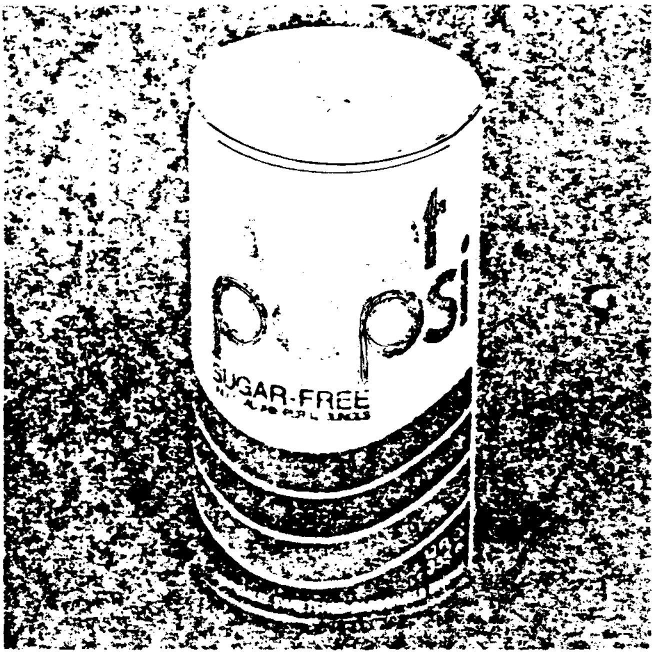


FIGURE 4

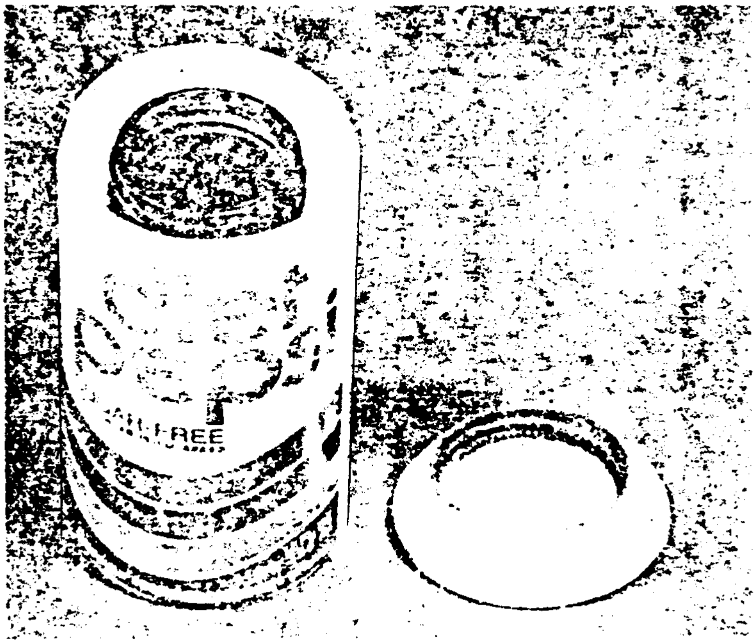


FIGURE 5: BOMB CONTAINER OPENED

As just illustrated, the placement of an explosive charge is only limited by the imagination. The suitcase below exemplifies this fact. The explosive device is located in the handle of the suitcase. Any pressure exerted upon this handle will activate the charge.

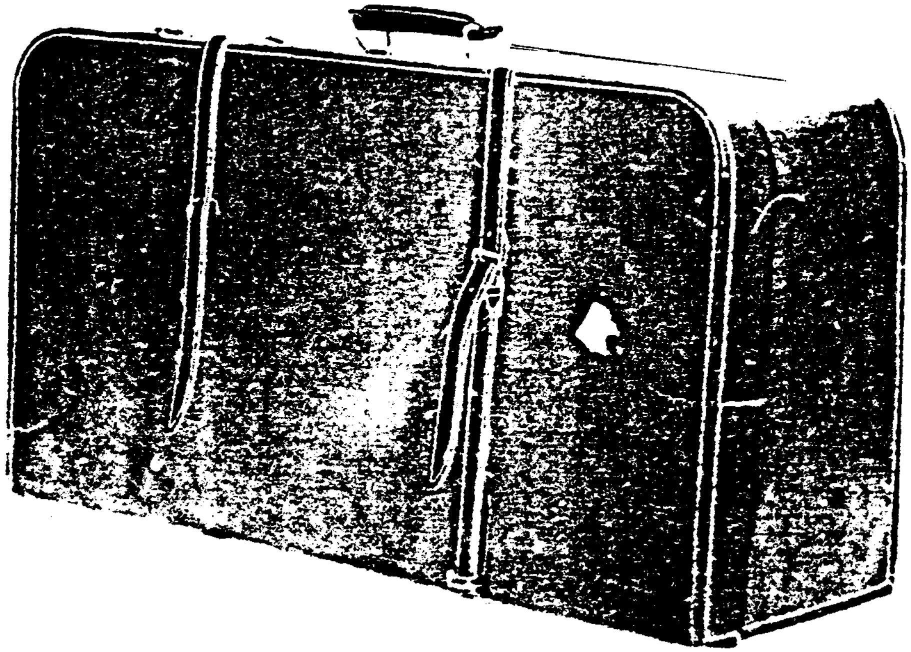


FIGURE 6

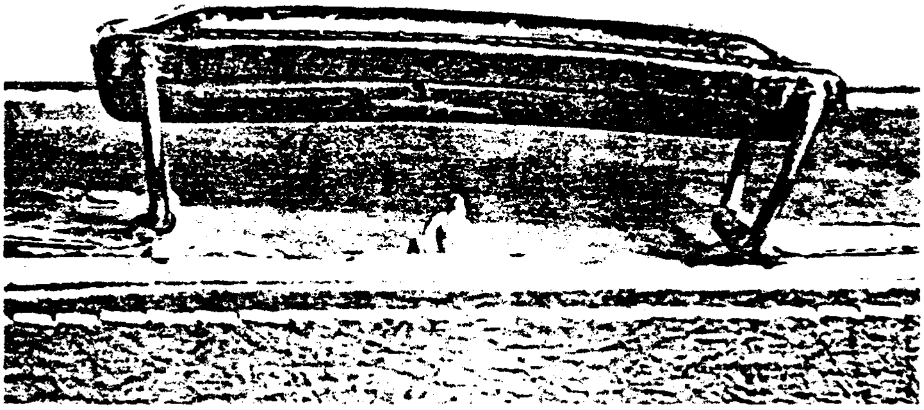


FIGURE 7: SUITCASE HANDLE INITIATOR

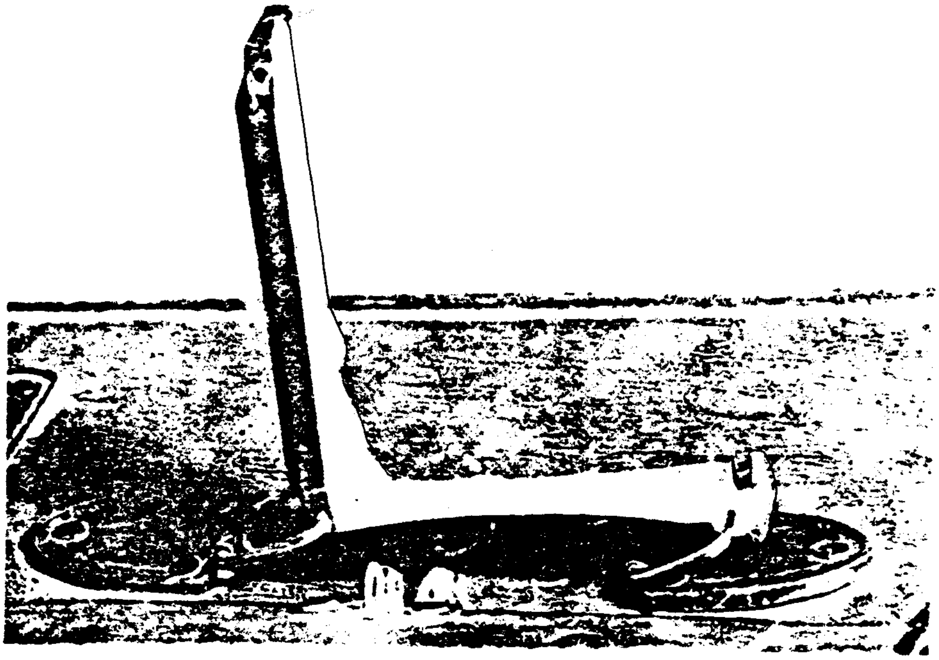


FIGURE 8

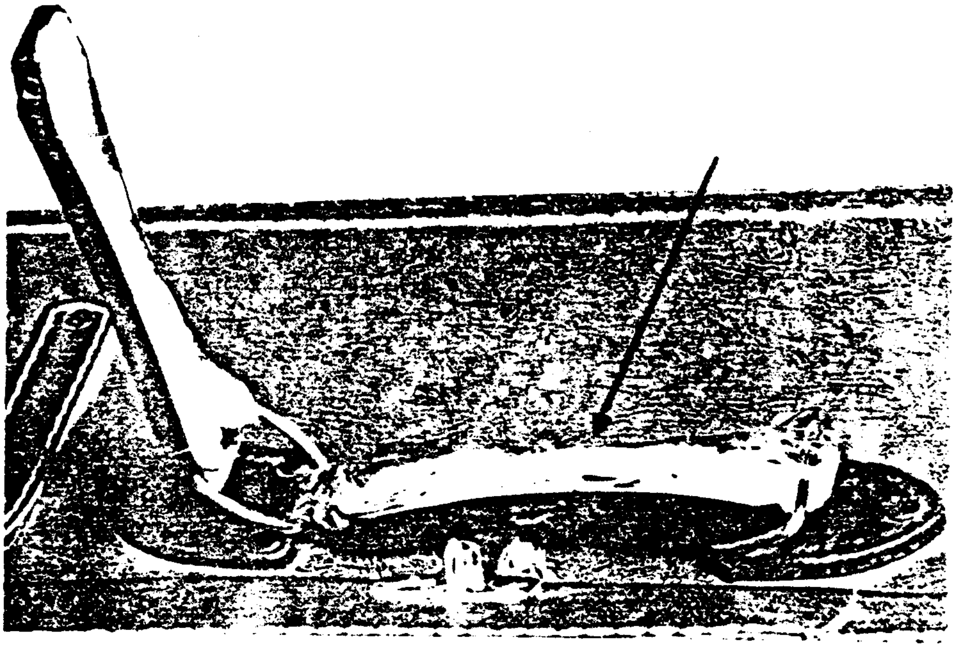


FIGURE 9

The lock on a piece of luggage can also be used to harbor a device. In the photo that follows both the explosive and activating device are located inside the suitcase lock. The electric blasting caps are encased in explosive.

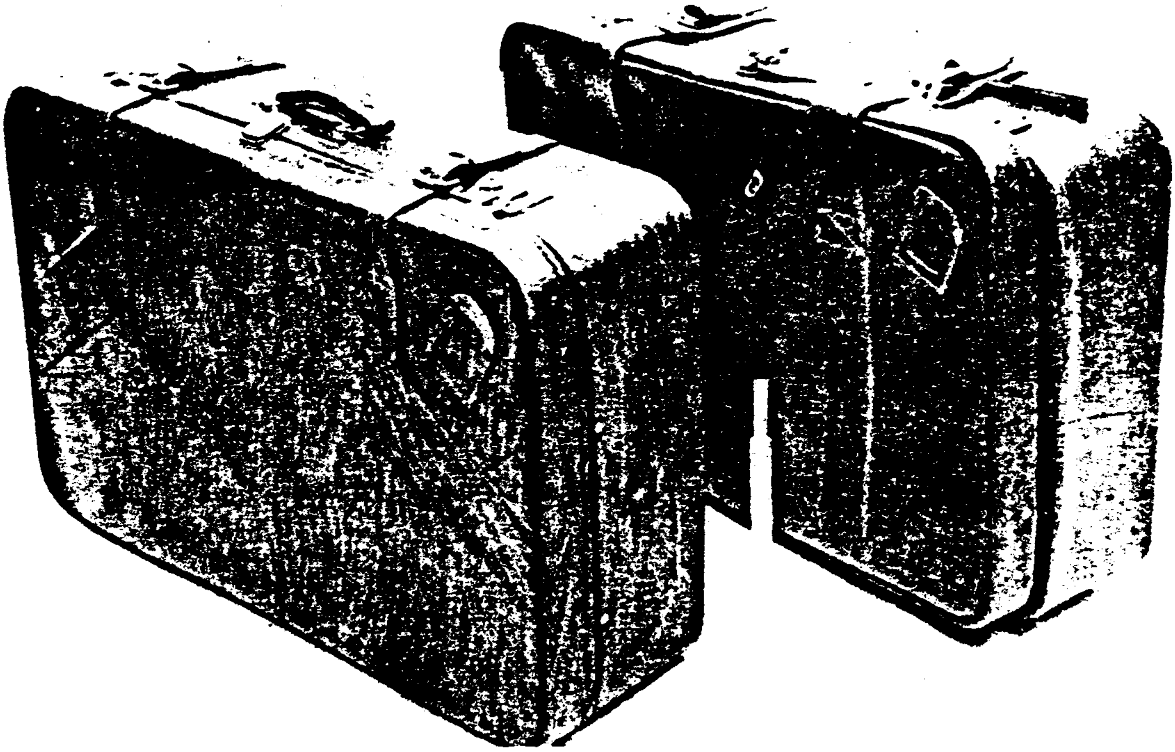


FIGURE 10

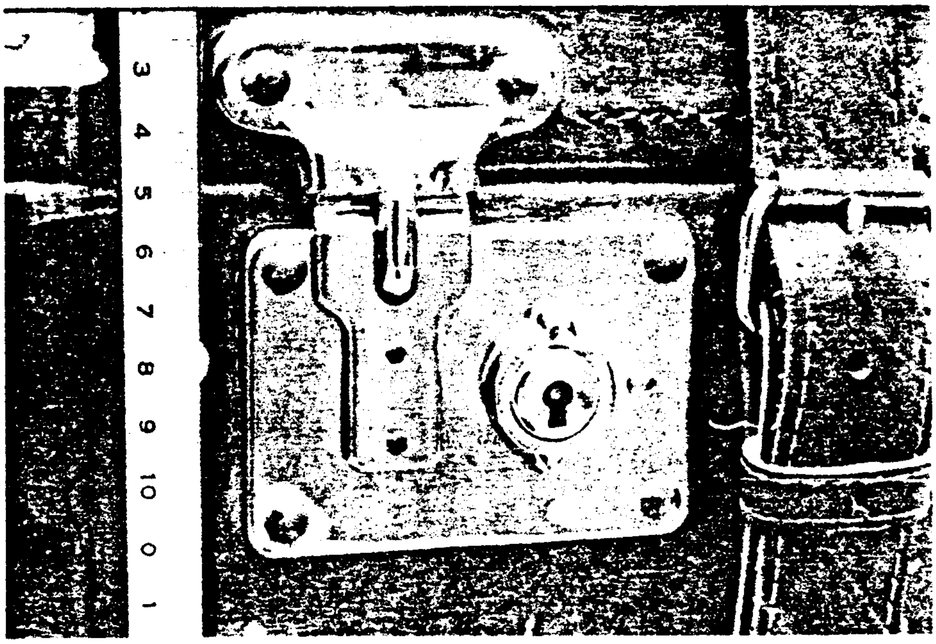


FIGURE 11: LOCK

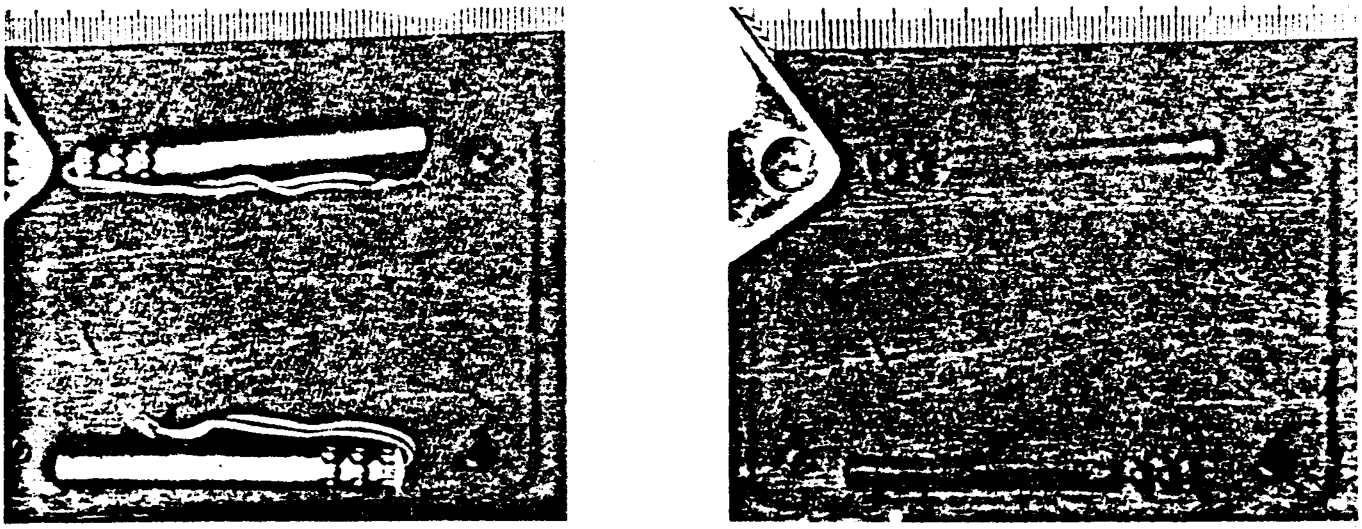


FIGURE 12: BLASTING CAP EMPLACEMENT

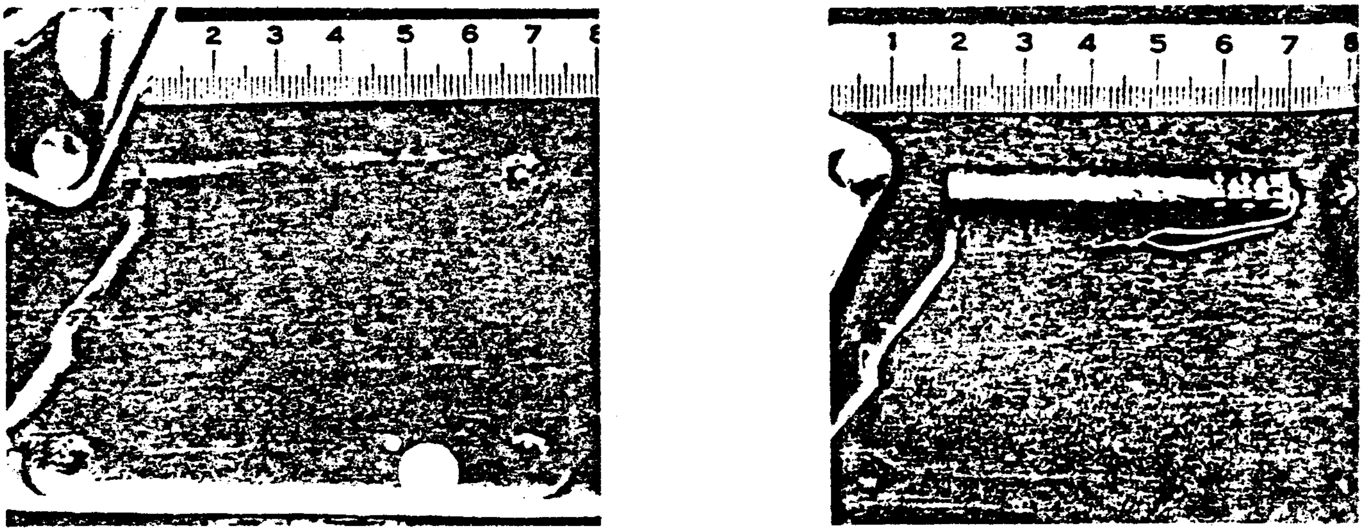


FIGURE 13: BLASTING CAP

## COMMENT

Arab terrorist groups, as well as other types of subversives are apt to use all types of various bomb devices and weapons. The examples documented are just a few of those being used throughout the world.

# AUTOMOBILE BOMBINGS IN MONTREAL

1. Classification: Restricted Technical Data.

2. Subject: Car Bombings in Montreal.

3. Source: Royal Canadian Mounted Police (R.C.M.P.).

4. Background: A message received from the R.C.M.P. has advised of two car bombings occurring in Montreal, Quebec, Canada on 14 December The R.C.M.P. has requested that the contents of this message be transmitted to explosive disposal technicians. Following is the message.

TECHNICAL INFORMATION

Following preliminary technical information on subject incidents relayed for the awareness of your explosive disposal technicians.

Device 1. Functioned causing extreme injuries to vehicle operator.

Device 2. Partially functioned. No injuries.

Three methods of initiation per device, identical in each case, as follows:

Primary method 1. Normal electrical connections through ignition system to blasting caps.

Secondary method 2. Two large clamp type electrical connectors; one to battery terminal; one to fan belt for contact with fan pulley on start of engine. Presumed to complement method 1 in event of malfunction.

Booby trap method 3. Clothespin "W" switch with jaw insulator attached to hood.

Explosive charges were Hydromex with pentolite primer. Two blasting caps per device were of European manufacture—Schaffler (Dynamit Nobel) with twin green leg wires.

Suspect that additional stocks of Hydromex and Schaffler caps are available as a result of thefts in eastern Ontario.

# BOOBY-TRAPPED FLIGHT BAG

1. **Classification: Restricted Technical Data.**

2. **Subject: Booby-Trapped Flight Bag.**

3. **Source: Foreign.**

4. **Background:** A recently reported foreign incident involved an improvised explosive device (IED) which had been booby trapped with intricate fuzing. The fuzing was designed to assure detonation if the device were discovered intact and an attempt made to dismantle it. In addition, the IED was designed to detonate on disturbance or within a period of approximately 30 minutes, if not previously disturbed.

## TECHNICAL INFORMATION

### General

The IED was a sophisticated device similar in design to those used by terrorist groups. See figure 1. Recovered unarmed, the device incorporated a complex electrical circuit which included anti-lift and anti-opening features in combination with collapsing (time-delay) circuits.

The fuzing contained two alternative circuits connected to a common detonator; both circuits were to have been armed by a single action of the perpetrator after he had placed the device in the target area. Once armed, the device was designed to detonate as follows:

- Instantaneously, if the flight bag were unzipped.
- Within 3 1/2 minutes, if the flight bag were lifted.
- Within approximately 30 minutes, if the device were not otherwise disturbed.

The fuzing system was constructed from two relays, one microswitch, four 1 1/2 volt power cells, and four 0.5 amp alarm fuses. Designed for one-time use, alarm fuses (also called "grasshopper" fuses) are used in telephone switchboards to indicate an overloaded circuit. See figure 2. Each fuse contains a spring-like contact held in position by a fusable element. When current flows through the element, it breaks (like a fuse wire), allowing the spring-like contact to change position and operate as a switch. Mounted on chipboard, the components of the fuzing system were located in the bottom of the flight bag, as illustrated in figure 1.

### Initial Arming Procedure

The metal studs which secured the handles of the flight bag constituted the arming contacts for the fuze. This enabled the bomber to safely transport the device to the target area where it was to have been armed in place by the simple insertion of a metal rod through the studs.

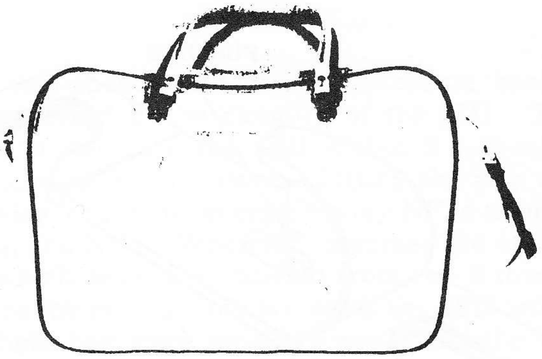
The metal to metal contact between the rod and the studs would have shorted the arming contacts and completed the two circuits containing cells A and B and fuses $F_1$ and $F_4$, respectively. As illustrated in figure 3, when current from cell A flows through fuse $F_1$, the fuse changes from its normal position to the energized position and allows cell A to energize relay R. Similarly, when current from cell B flows through fuse $F_4$, causing it to change to the energized position, cell B is placed in circuit with relay NF. However, relay NF is not energized at this point because its circuit is held open by the microswitch (which only closes when the flight bag is picked up).

### Time Delay and Anti-Opening Circuit

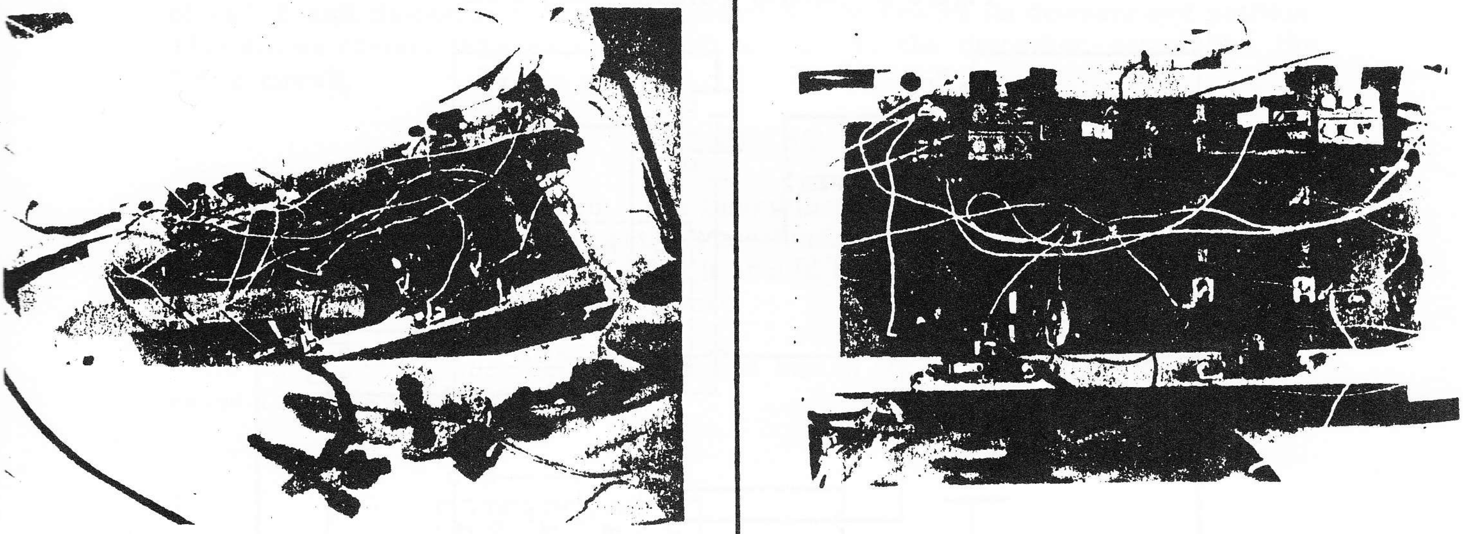
Once cell A has been placed in circuit with relay R through the functioning of fuse $F_1$, relay R, which is a double pole relay, closes contacts $R_2$ and $R_1$. Contacts $R_2$ and $R_1$ are in circuit with two additional cells (C and D) which are incorporated in the circuit to provide power to the detonator.

When relay R is energized, it causes contact $R_2$ to assume its energized position, placing fuse $F_2$ in circuit with cells C and D. The functioning of fuse $F_2$ places cells C and D in circuit with the detonator and contact $R_1$. Contact $R_1$ is open while relay R is energized and thus the detonator will not function until relay R de-energizes and allows contact $R_1$ to close. Relay R can become de-energized through either of two ways:

- When cell A, holding relay R in the energized position, has its energy consumed (within approximately 30 minutes), it is no longer capable of powering relay R. Relay R thus becomes de-energized, contact $R_1$ closes, and the firing circuit to the detonator is completed.
- An anti-opening feature built into the zipper of the flight bag is also incorporated in the circuit containing cell A and relay R. Consisting of pieces of wire laced through the zipper, the anti-opening device conducts the current from cell A to relay R. As long as the zipper remains undisturbed, the circuit remains unbroken; however, if an attempt is made to open the zipper, the circuit collapses instantaneously, de-energizing relay R and causing the device to detonate as described above.



External View



Internal Views

Figure 1. Booby-Trapped Flight Bag

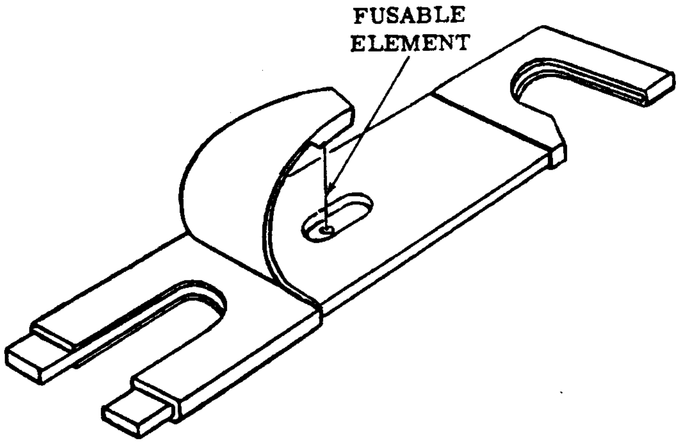
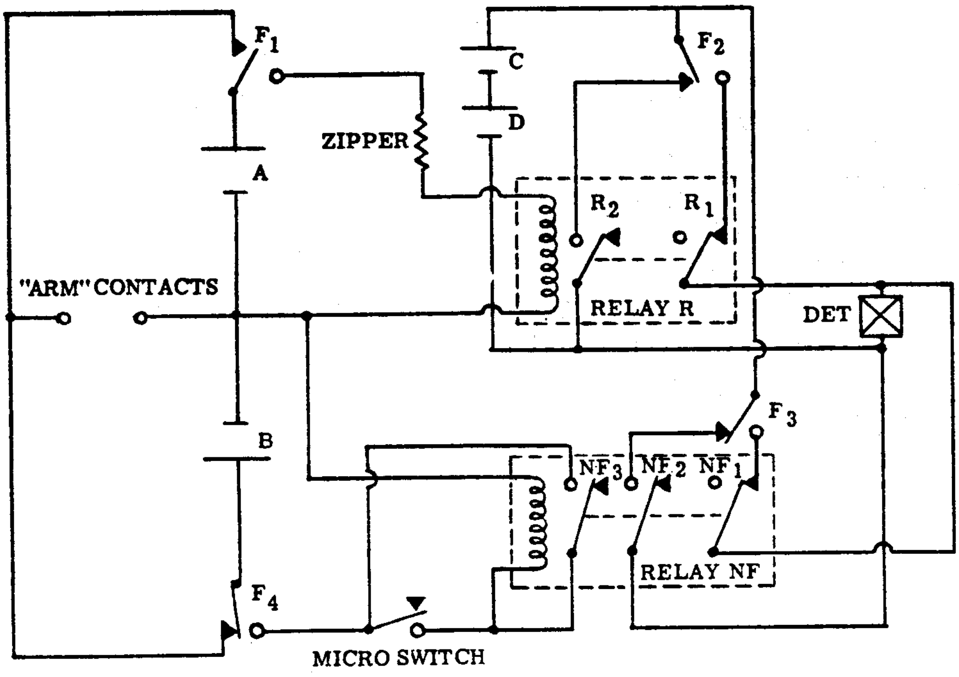


Figure 2. Alarm (Grasshopper) Fuse



▲ NORMAL POSITION

○ ENERGIZED POSITION

RELAY R = DOUBLE POLE- DOUBLE THROW

RELAY NF = TRIPLE POLE- DOUBLE THROW

Figure 3. Fuzing System

## Anti-Lift Circuit

In addition to the anti-opening feature, an alternate booby trap triggered by a microswitch was incorporated in the circuitry of the IED. This feature, an anti-lift device, was designed to detonate the IED within 3 1/2 minutes if the flight bag were lifted with the arming rod in place. Lifting the bag would permit the microswitch to close, allowing cell B to energize relay NF, a triple pole relay which operates contacts $NF_1$, $NF_2$, and $NF_3$. When $NF_3$ assumes the energized position, it closes an alternate circuit which maintains current from cell B to energize relay NF. (An irreversible action, once the microswitch is closed, the IED will detonate within 3 1/2 minutes even if the flight bag were set down again and the microswitch re-opened.)

When contact $NF_2$ assumes the energized position, it allows current from cells C and D to flow through fuse $F_3$, causing it to assume the energized position. In this position, fuse $F_3$ places cells C and D in circuit with the detonator and contact $NF_1$. Contact $NF_1$ in its energized position remains open with respect to the circuit containing cells C and D and the detonator. Relay NF rapidly consumes the energy of cell B and de-energizes, causing contact $NF_1$ to assume its de-energized position. This allows current from cells C and D to flow to the detonator, completing the firing circuit.

## COMMENT

This device was well designed. The fuzing incorporates three means of detonation including a unique delay in the anti-lift mechanism. Although a dismantling procedure was not applied to this device, it should be emphasized that it was designed to detonate 30 minutes after being armed.

Do not use cryogenics because it would hasten the decay of cells A and B, and cause the device to detonate.

# COLLAPSING CIRCUIT RELAY AND PRESSURE-RELEASE SWITCHES

1. **Classification: Restricted Technical Data.**

2. **Subject: Collapsing Circuit Relay and Pressure Release Switches.**

3. **Source: Canadian Bomb Data Centre (CBDC).**

4. **Background:** Through the courtesy of the Royal Canadian Mounted Police, CBDC Technical Bulletins and are reprinted below. This information is being disseminated to NBDC participants because the switches involved in the two devices and the manner in which these incidents were handled are significant.

## TECHNICAL INFORMATION

### CBDC Technical Bulletin

A small pipe bomb, which had been placed beneath a "Mobile Canteen" truck parked in the driveway of a private residence, functioned causing an estimated $1000 damage to the target vehicle and surrounding area.

Montreal Urban Community Police Technical Section personnel attended the scene and reported:

- The device had been placed midway between the front and rear wheels on the left hand (driver's) side of the vehicle.
- A crater in the asphalt surface of the driveway, marking the point of detonation, measured 7 1/2 inches in diameter and 2 1/2 inches in depth.
- The majority of fragments pierced the target vehicle in the beverage and food storage area. Some fragments struck a second vehicle parked on the opposite side of the driveway parallel to and in line with the target. Seven pipe fragments struck or passed through wooden garage doors to the rear of the truck.
- In all, 57 pipe fragments, not including other device components, were recovered and photographed. The majority of pipe fragments collected showed threads indicating the possible use of a coupling. (Extensive threading of the container would also increase the fragmentation effect). See figure 1.

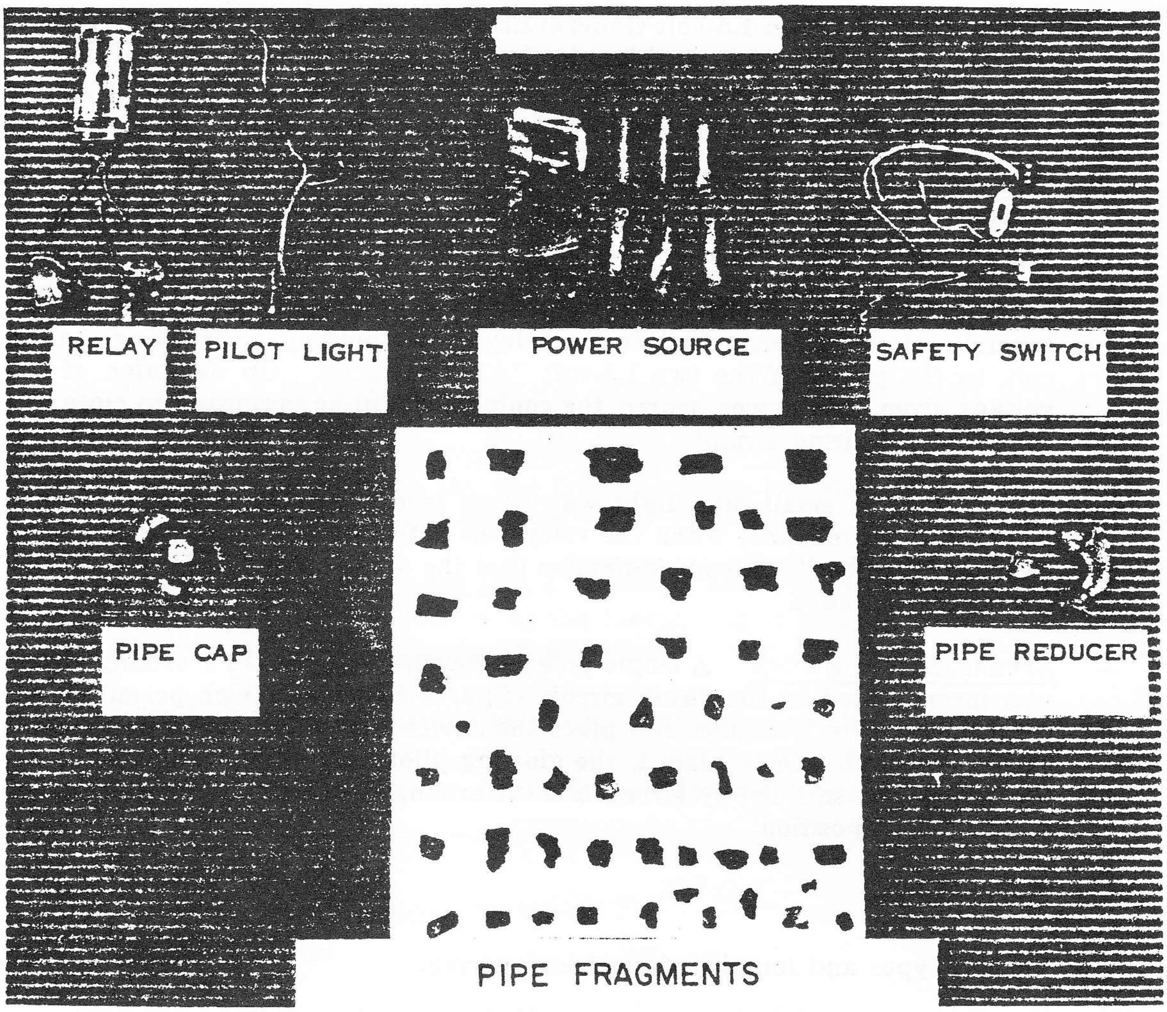


Figure 1

**Device Components**

- Container. A 1 1/2- to 2-inch diameter mild steel coupling with one end closed by a cast iron cap. The opposite end was partially closed with a cast iron reducer through which electrical leads extended from the detonator to the firing circuit.
- Explosive Charge. The pipe fitting is thought to have been dynamite filled.
- Initiator. Electric blasting cap of unknown type.

- Power Sources. Two 1.5-volt General Electric, Type "AA" Model 6C1 Perma-Cell batteries contained in a white plastic battery holder complete with snap-on type electrical connector. See figure 1. The purpose of this power source was to operate the delay circuit.

- Two 9-volt Duracell alkaline batteries, Model MN1604. These batteries constituted the power source, wired through the delay circuit, to the electric blasting cap. See figure 1.

- Delay. An encased electrical relay of unknown model or manufacture. The normally closed contacts (within the relay) were held open, breaking the circuit, by the power of the two 1.5-volt "AA" batteries. On depletion of the voltage from this power source the contacts would be permitted to close and complete the firing circuit.

- Pilot Light. A small pilot light was wired into the relay circuit in such a manner as to illuminate when the relay was activated. This would then provide the "bomber" with an indication that the delay circuit (relay) was functioning as intended.

- Arming/Safety Switch. A single pole single throw (ON/OFF) arming switch was incorporated in the firing circuit (figures 1 and 2) which permitted the bomber to safely transport and place the device with the delay circuit electrically connected. Once placed, the glowing pilot light would indicate the delay power was sufficiently strong and the arming switch could be safely moved to the "ON" position.

**Other Components**

- Various types and lengths of electrical wiring.

- Black plastic electrical tape.

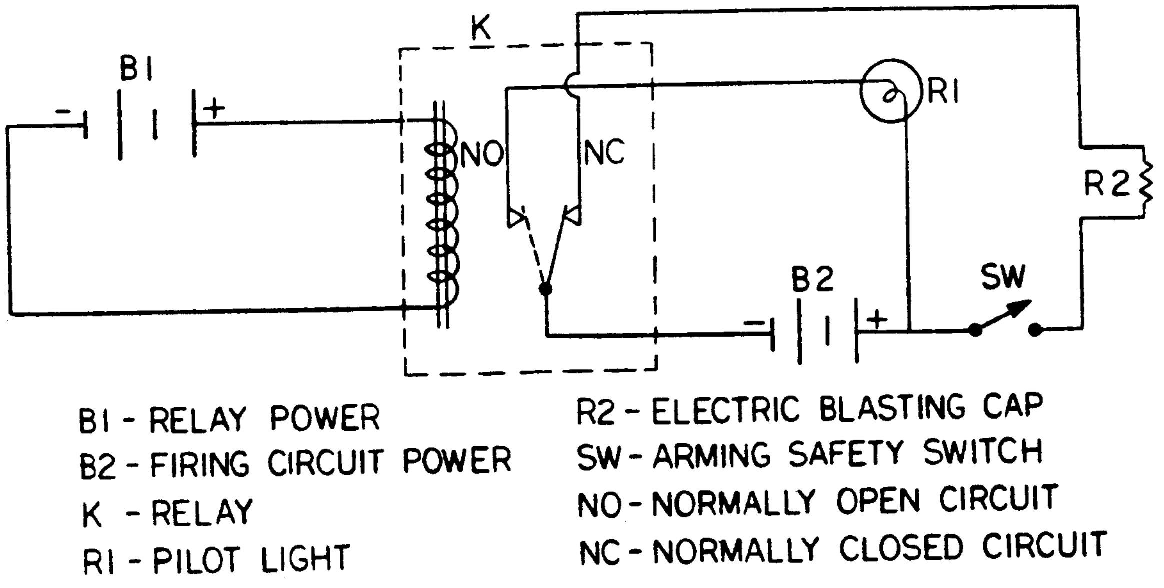

K
B1
-
+
NO
NC
R1
R2
B2
SW
B1 - RELAY POWER
B2 - FIRING CIRCUIT POWER
K - RELAY
R1 - PILOT LIGHT
R2 - ELECTRIC BLASTING CAP
SW - ARMING SAFETY SWITCH
NO - NORMALLY OPEN CIRCUIT
NC - NORMALLY CLOSED CIRCUIT

Figure 2

## Construction

The electrical delay fuzing system components; relay, relay power source, pilot light, detonator power source and safety/arming switch had all been taped to the external surface of the device. Only the detonator and explosive charge were inside the container (pipe).

## Comments

Electrical checks of the two recovered power source components revealed that:

- of the two AA batteries (relay power source), one was completely devoid of charge while the second registered approximately 1 volt; and
- although badly mutilated, the two 9-volt Duracell batteries (detonator power source) each still registered between 6 and 7 volts.

It can be readily appreciated that a thorough and extensive sweep of the incident area had been conducted following the functioning of this device. Identifiable parts of all components were recovered allowing:

- reconstruction and determination of the functioning method; and
- the provision of a maximum of physical evidence to assist investigators.

## CBDC Technical Bulletin

The recipient of a threatening phone call searched the area surrounding his home and, buried in a garden at the side of the house, discovered a sealed 6 - 8 ounce glass bottle partially filled with liquid and containing what appeared to be a mechanism wrapped in a rag. Police were notified and informed of the threat and subsequent discovery.

The attending police bomb technician carefully exposed the complete jar by removing the dirt from around it. The jar was next taped to a sling and remotely deposited into the bin of the transport vehicle. On arrival at a safe area the device was remotely removed from the bin and placed on a bed of straw for attempted dismantling.

The following sequence took place:

- The lid of the container, a glass coffee jar, was removed.
- The rag was carefully extracted.
- It was then noted that the rag was tightly wound around what could possibly be two penlight batteries and a vial.
- The possibility was considered that, if in fact these components were enclosed by the tightly bound cloth, a pressure release switch could also be an integral component.

- An attempt was made to open the unknown component assembly with the use of an electrical blasting cap.
- On firing, a high order detonation resulted, completely destroying the device.

THIS INFORMATION IS OFFERED AS GENERAL KNOWLEDGE ONLY AND IS NOT INTENDED AS A CONCLUSIVE PROCEDURE FOR ADOPTION IN LIKE CIRCUMSTANCES. GUARANTEED RENDER SAFE PROCEDURES (RSP's) FOR IED'S CANNOT BE PREDEFINED DUE TO THE UNLIMITED POSSIBILITIES IN METHODS OF CONSTRUCTION.

## Comments

An exhaustive search of the area following detonation failed to reveal any components or component parts. Technicians on the scene suggest the possibility that the device was composed of:

- 2 Penlight batteries
- an electric blasting cap
- a vial of nitroglycerine, and
- an electrical pressure release type switch

If this was the case and an untrained, unsuspecting person had attempted identification and dismantling, serious injury or death could have resulted.

# CROATIAN SEPARATISTS BOOK BOMBS

**BOOK BOMBS SENT BY CROATIAN SEPARATISTS**

**SOURCE:** Domestic.

Continued unrest in an uneasy middle European melting pot occasionally erupts in the United States. The two incidents mentioned in this FBI Bomb Data Center (BDC) bulletin are thought to have been perpetrated by participants in this controversy - individuals from the northwestern Yugoslavian region of Croatia.

The inclusive boundary of the present nation Yugoslavia was established in encompassing several smaller national entities which have not entirely surrendered their individual ethnic characters to the conglomerate state. Serbs, Croats, Slovenes, and Montenegrins have, for example, continued to foment rebellion, with the areas of contention being defined by racial ties. During the past 60 years facets of this conflict have waxed and waned. The exigencies of religion (Roman Catholicism vs. Eastern Orthodoxy) the rise of Nazism and the attendant German occupation of Yugoslavia; and the establishment of the Tito government in Belgrade helped determine the alliances and enmities of this civil unrest.

Although a Croat by birth, Tito used a Serbian power base to gain ascension and unify his diverse nation. His lack of sympathy toward other ethnic formations within Yugoslavia, including Croatia, led to separatist movements within the aggrieved communities. Advocates of Croatian separatism today include a spectrum of ideologies from former Nazi supporters to leftists who dislike the present regime. In spite of this, most Croatian dissidents are nonviolent.

Frequently, however, it is through the activities of the minority who do espouse violence that Croatian separatism is known outside Yugoslavia. For example, Croatian separatists were responsible for a multi-faceted incident during September, It included both an aircraft hijacking and the emplacement of an improvised explosive device (IED) in a New York City terminal. While no injuries were sustained by the passengers in flight between New York and Chicago, one New York City police officer was killed and three others wounded during a render safe attempt at Rodman's Neck, New York. The terrorists demanded, as part of this incident, that leaflets detailing their grievances be dropped over London and Paris. Their request during an August, incident was somewhat more complicated. Two terrorists took over the West German Consulate in Chicago and held several hostages, while demanding that a Croatian extremist incarcerated in West Germany not be extradited to Yugoslavia. This situation was concluded without injuries. The IED which were recently mailed by Croatian terrorists, and which this bulletin addresses, comprise less spectacular, but no less dangerous, incidents. One of these cases and the IED recovered is discussed in detail below. Both bombs were alike.

## The Incident

During the morning of February 26 a Catholic priest in Milwaukee, Wisconsin, received a bulky manila envelope through the mail. It bore a misspelled version of his name, his address, and the return address of an individual with whom he had been acquainted for several years. An FBI Agent, coincidentally talking to the priest, recognized the package to be suspicious, grabbed it from the clergyman, and took it to a courtyard. Milwaukee Police Department bomb squad personnel were summoned to examine the suspicious package. An explosive disposal technician, attempted a hand entry render safe procedure and suffered the loss of part of his index finger when the blasting cap exploded.

## The Device

The device was enclosed in a hollowed-out book, an anthology of short stories measuring approximately 6 1/2 inches by 8 1/2 inches by 1 3/4 inches. It contained one 9 volt Eveready transistor radio battery and two, half-sticks of commercial dynamite (Atlas 40% gelatin), measuring approximately 3 inches by 3/4 inch in diameter. Additional components included a blasting cap and a loop switch. See Figures 1 and 2. The entire IED was sealed in two envelopes for mailing.

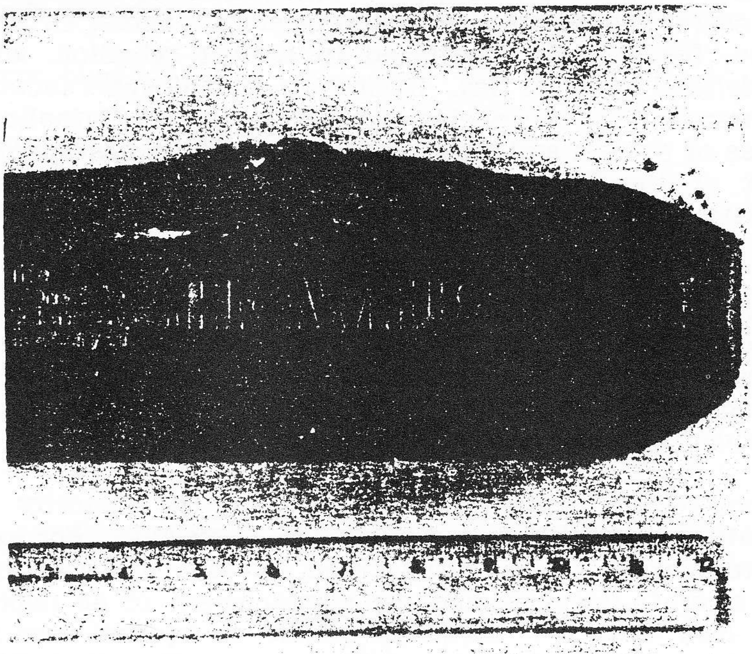


FIGURE 1: CLOSED BOOK CONTAINING IED.

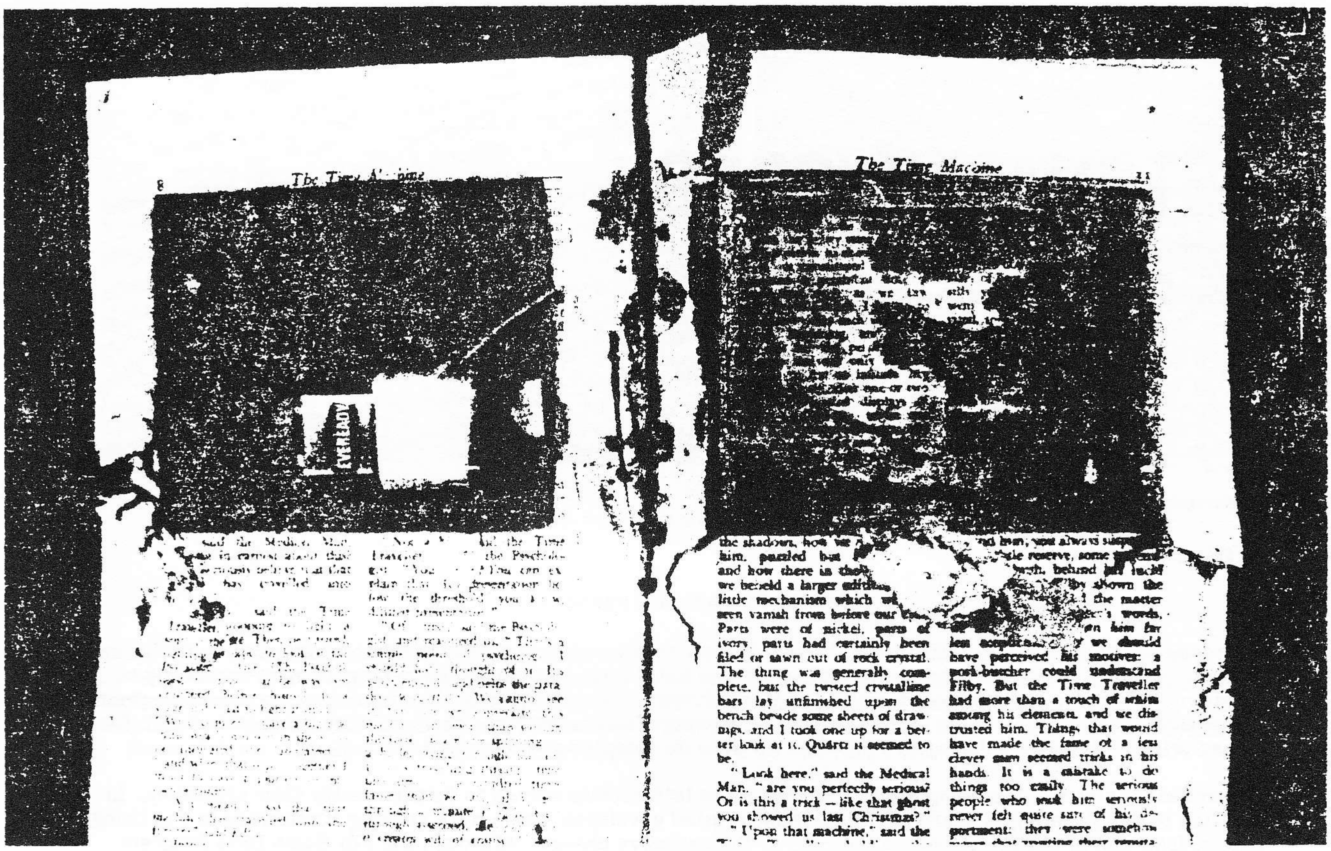


FIGURE 2: OPEN IED.

The dynamite was scattered about the hollowed portion of the book but failed to detonate, thus sparing the life of the technician. Following hours of extensive surgery, this individual is recuperating.

# DETONATING CORD LETTER BOMBS

1. Classification: Restricted Technical Data.

2. Subject: Detonating Cord Letterbombs.

3. Source: Foreign.

## INTRODUCTION AND BACKGROUND

Improvised explosive devices (IED) sent through the mail are a constant threat to person and property in this age of do-it-yourself terrorism. Prominent businesses and individuals considered likely targets must constantly be on guard. The three letterbombs described in this publication were sent to such potential targets: a state premier, a governor general, and a prime minister; all high ranking officials from the same country. One letterbomb functioned prior to delivery, injuring two people; two were intercepted and disarmed.

Subsequent analysis of the components from the three letterbombs served to further verify their similarity. In addition to being mailed in nearly identical, hand printed envelopes, there were striking similarities in the firing mechanisms and in the use of detonating cord as the explosive charge. Although the FBI Bomb Data Program (BDP) has published several bulletins dealing with mail bombs, only the identical letterbombs detailed in IB contained detonating cord as the explosive filler.

## TECHNICAL INFORMATION

On November 19, a mail clerk opened an envelope addressed to the state premier, and placed its contents on a work desk. Although no one was handling the device when it exploded, two public service employees were injured by the blast. The main force of the explosion was apparently projected downward, leaving a hole 8 inches in diameter in a 3/4 inch plywood desk top. Some of the damage can be seen in Figure 1. Two components, identical to those in the other letterbombs, were photographed on the floor near the desk. See Figure 2. Later that same day and on , letterbombs addressed to the prime minister and the governor general, respectively, were intercepted before delivery and dismantled by police and army explosive ordnance disposal (EOD) technicians. Prior to discovery of the third IED, a written threat was received by a daily newspaper.

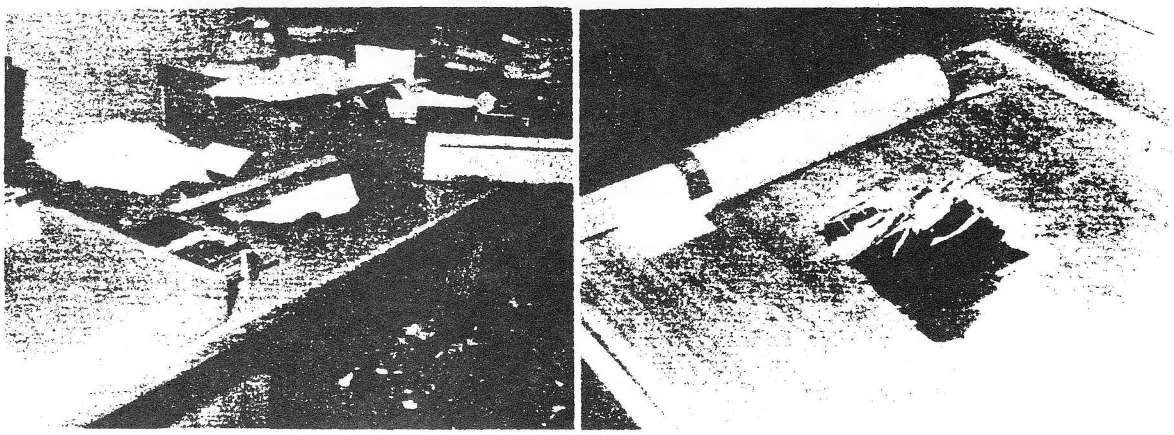


FIGURE 1: DAMAGE TO DESK ON WHICH LETTERBOMB WAS PLACED

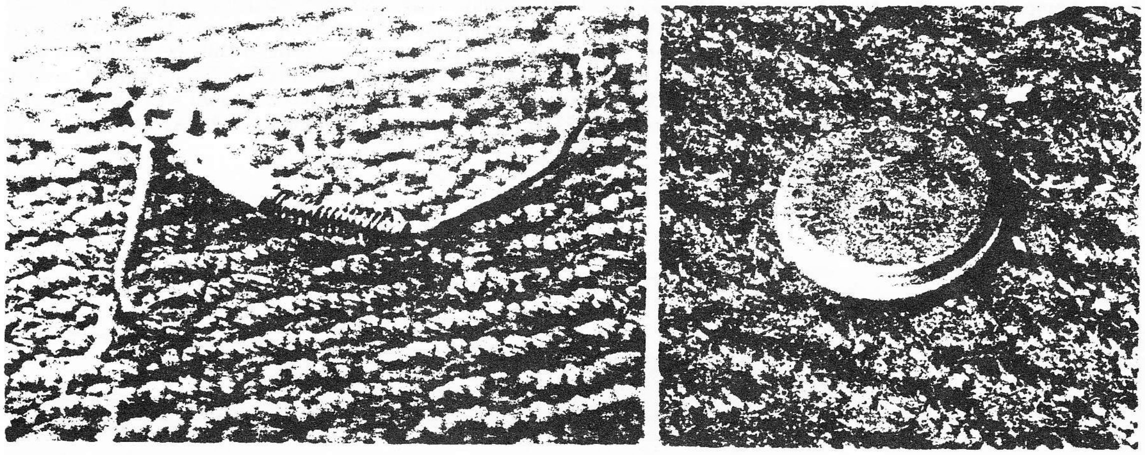
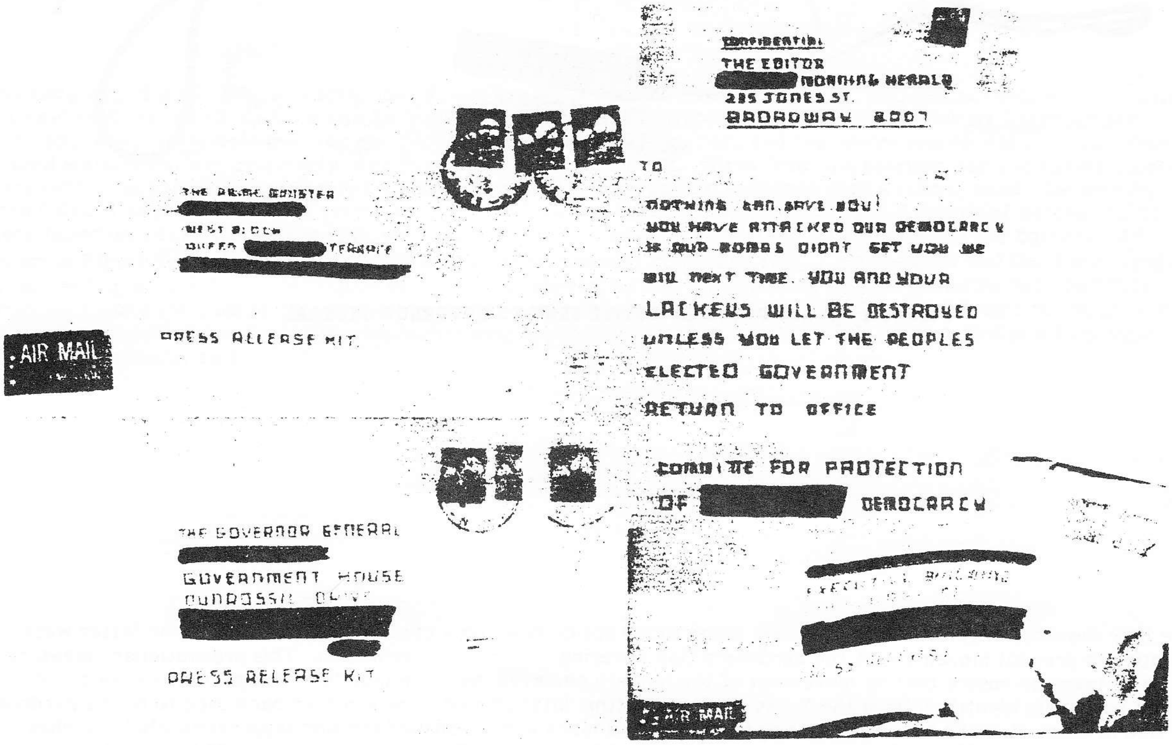


FIGURE 2: FUZING MECHANISM AND BATTERY PHOTOGRAPHED FOLLOWING EXPLOSION

The IED were contained in similar buff or manila colored envelopes that opened from the end. Average envelope dimensions were approximately 9 inches by 4 inches. A 2 3/4 inch by 4 1/2 inch hand printed address sticker was attached to each envelope, and the words PRESS RELEASE KIT were printed at the bottom of each label. As can be seen in Figure 3, the printing on the envelopes and the threat letter is identical. Pages from a November issue of Time magazine were used to wrap the devices prior to inserting them into the envelopes.



CONFIDENTIAL
THE EDITOR
[redacted] MORNING HERALD
235 JONES ST.
BROADWAY 2007

THE PRIME MINISTER
[redacted]
WEST BLOCK
QUEEN [redacted] TERRACE
[redacted]

PRESS RELEASE KIT

AIR MAIL

TO

NOTHING CAN SAVE YOU!
YOU HAVE ATTACKED OUR DEMOCRACY
IF OUR BOMBS DIDNT GET YOU WE
WILL NEXT TIME. YOU AND YOUR
LACKEYS WILL BE DESTROYED
UNLESS YOU LET THE PEOPLES
ELECTED GOVERNMENT
RETURN TO OFFICE

COMMITTE FOR PROTECTION
OF [redacted] DEMOCRACY

THE GOVERNOR GENERAL
[redacted]
GOVERNMENT HOUSE
DUNROSSIL DRIVE
[redacted]

PRESS RELEASE KIT

[redacted]
EXECUTIVE BUILDING
[redacted]
PRESS RELEASE

AIR MAIL

FIGURE 3: COMPARISON OF PRINTING ON ENVELOPES AND THREAT LETTER

The letterbomb addressed to the prime minister was received by postal bag, intercepted prior to delivery without the use of detection equipment, and disarmed by a police bomb technician. After being retrieved from a postal depot, the letter to the governor general was subjected to an X-ray examination. Through this examination, authorities were able to pinpoint and identify a small circular battery, an electric blasting cap, some wiring, a small spring, and straight pins. See Figure 4. A less distinct image of two coils of cord-like material was also detected. Render safe procedures (RSP) were conducted by military EOD personnel after studying the X-ray photograph.

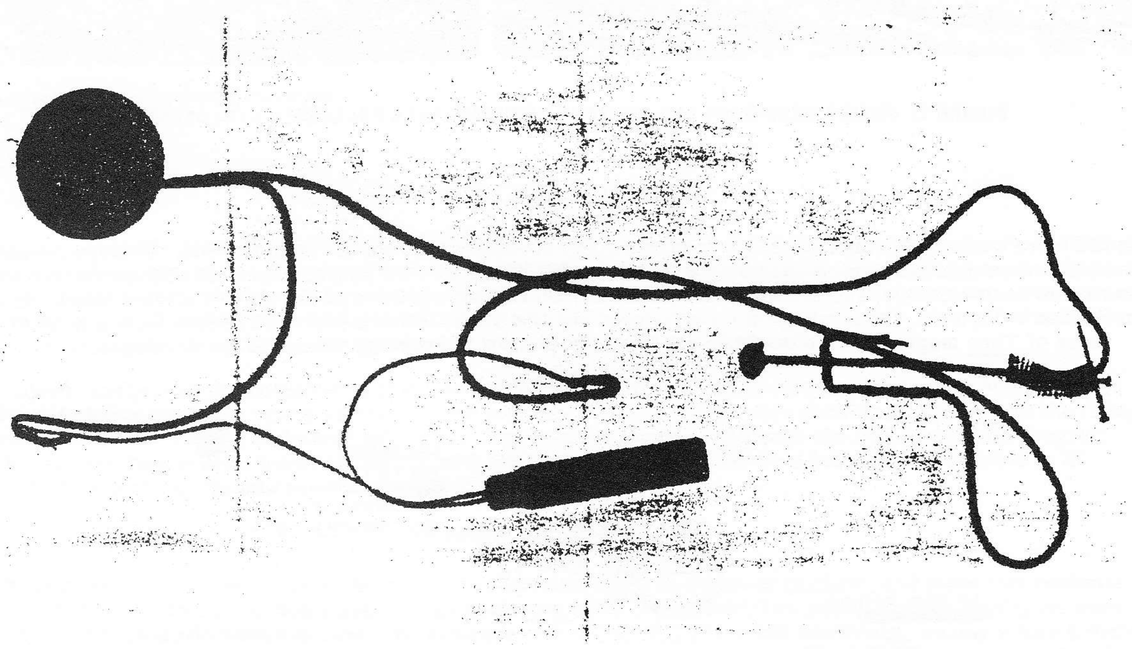


FIGURE 4: X-RAY PHOTO OF DEVICE SENT TO GOVERNOR GENERAL

The RSP sequence began with the envelope being taped upside down on a clipboard. Both ends of the letter were clamped to prevent movement of the cardboard flap covering the trigger mechanism. This precautionary measure was also taken to ensure that no movement of the battery occurred, since an indistinct image in this area could not be positively identified from the X-ray photograph (this later proved to be a rubber band used to hold a cardboard section in place over the battery). A scalpel was used to make a cross-shaped incision (approximately 1 ½ inches from the blasting cap) through the envelope and its inner wrapping of Time magazine pages. This procedure exposed the blasting cap leg wires, allowing them to be cut and the blasting cap to be removed. Working from this same opening, the back of the envelope was carefully removed to reveal the remaining contents. See Figure 5.

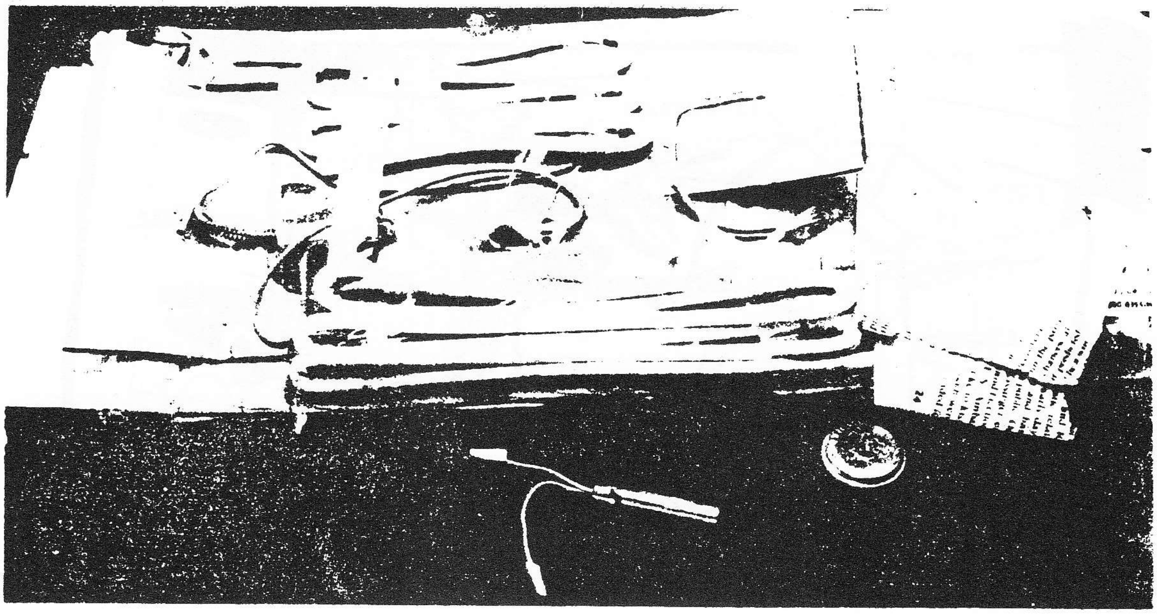


FIGURE 5: CONTENTS OF LETTERBOMB SENT

The following is a composite description of how the letterbombs were constructed: IED components were mounted with cellulose tape and epoxy on an 8½ inch by 4 inch piece of cardboard fitted with a 4 inch by 2 inch hinged end flap. A No. 6 electric blasting cap provided the means of initiation, and the power source was a 1.5 volt disc-shaped Mallory battery commonly used in photographic equipment. Wires from the blasting cap and fuzing mechanism were held in position on the battery by a smaller section of cardboard anchored with a rubber band. Detonating cord filled with pentaerythritol tetranitrate (PETN) was used as the explosive charge. Lengths of detonating cord were taped on either side of the IED. with the shorter sections placed on the side occupied by the battery. As shown in Figure 6, the letterbomb mailed to the prime minister contained five, 7 inch lengths and six, 4 inch lengths of detonating cord with a total explosive content of approximately 14½ grams of PETN. Cellulose tape had been wrapped around the ends of the detonating cord to prevent loss of the PETN filler. The device sent to the governor general consisted of two longer lengths (containing approximately 16 grams of PETN), each coiled in a loop-type configuration (refer to Figure 5).

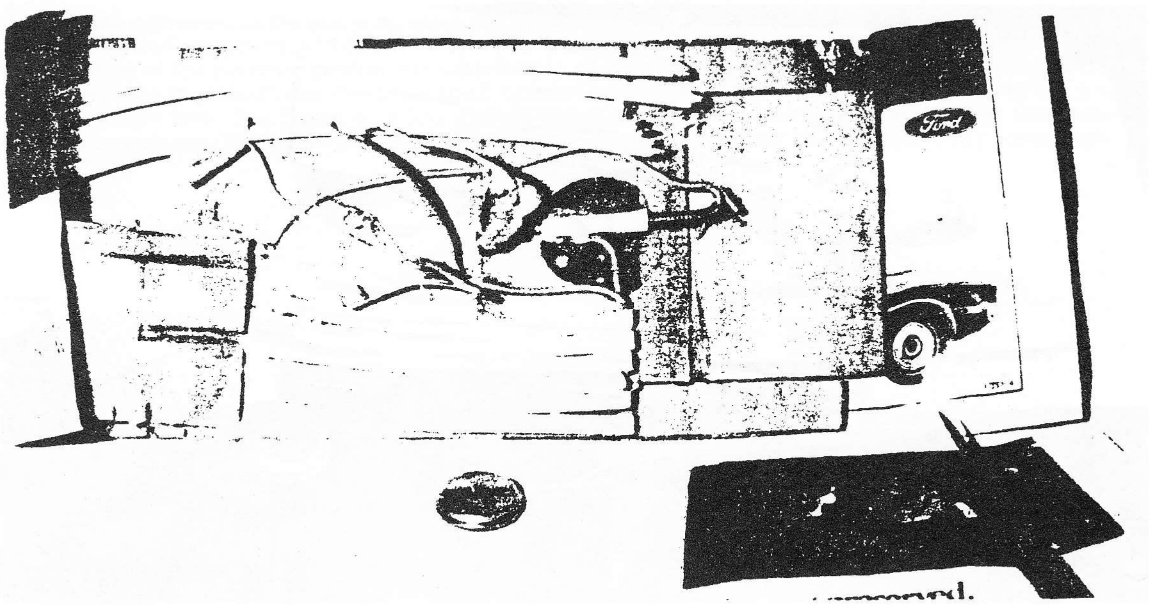


FIGURE 6: LETTERBOMB MAILED TO PRIME MINISTER

Construction of the fuzing mechanism, or firing switch, illustrated in Figure 7 was as follows: A piece of 8 inch by 1½ inch white paper was rolled tightly to form a 1½ inch long tube. This tube was cemented near the hinged end flap portion of the mounting board. A section of gray insulated wire was attached to a blasting cap leg wire and passed over one end (away from the flap) of the paper tube, terminating in a soldered loop positioned over the end of the tube. The other blasting cap leg wire was fastened to the battery. A second length of gray wire running from the battery was fitted with a spring and passed through the paper tube. The spring was similar to those found in retractable ballpoint pens, and was held in place by one straight pin placed through the wire directly beneath the spring. To allow for greater leverage in forcing the cardboard end flap open, a length of wire insulation was stuck onto a second pin, and the pin was wedged lengthwise along the spring. This wire from the battery was run completely through the tube and out beyond the soldered loop. A ball of solder larger in diameter than the soldered loop was then attached at the end of this length of wire.

With the end flap closed and the IED inside the envelope, the spring would be tight against the paper tube, forcing the solder ball away from the soldered loop. Opening the envelope and removing the inner wrapping of magazine pages would free the end flap and release the spring tension, allowing the soldered ball and loop to make contact, completing the circuit.

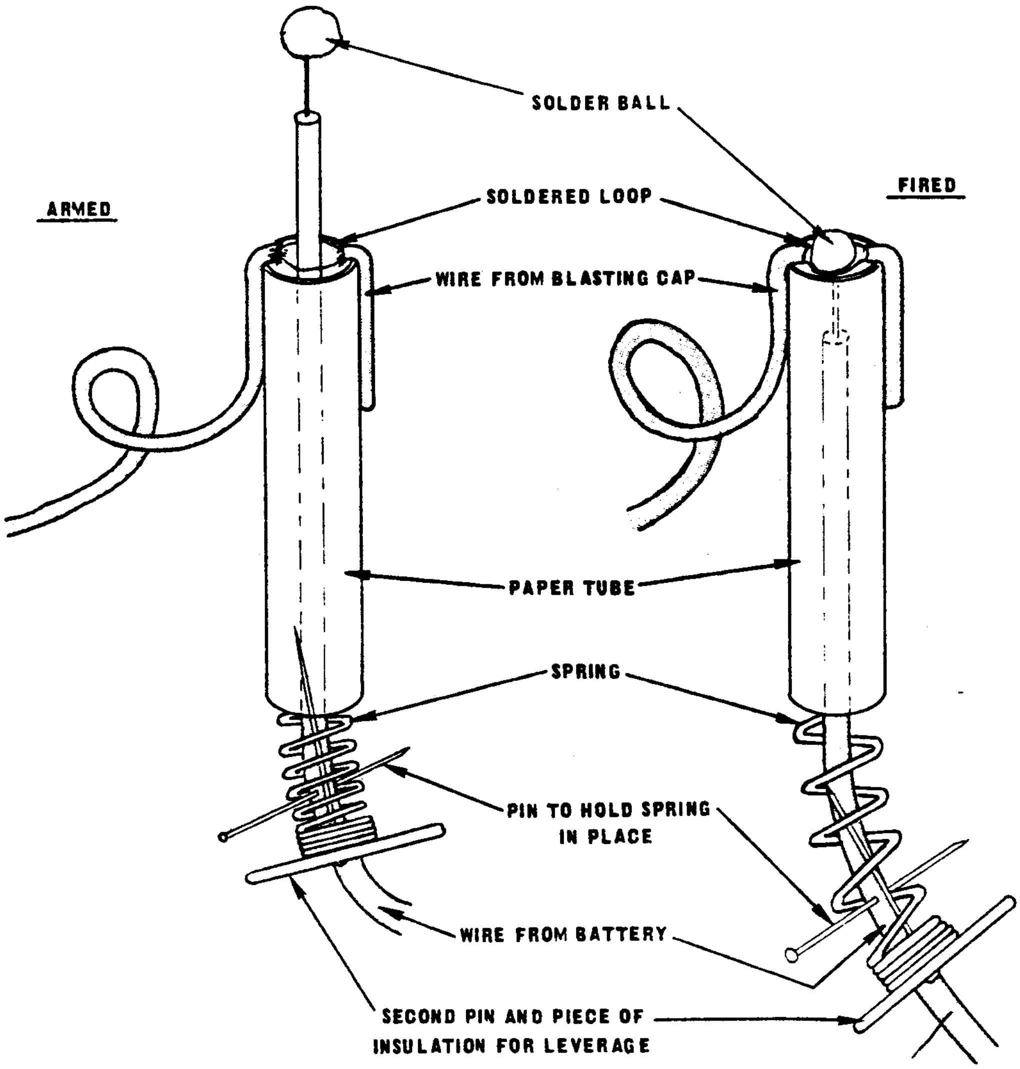


FIGURE 7: ARTIST'S CONCEPTION OF FUZING MECHANISM

## COMMENT

As illustrated by the explosive devices discussed in this bulletin, tightened security is imperative in detecting mail bombs. Nevertheless, an occasional device will explode while in the mail system before it can be detected and dearmed. This fact underlines the need for proper training with emphasis on exercising caution. when dealing with situations which could involve use of the mails to transport explosive devices to likely targets.

*The disarming procedure in this bulletin is presented as general information only, and is not intended as a conclusive method to be used in similar circumstances. There are no safe procedures for disarming IED, since construction methods are limited only by the imagination and resources of the individual(s) who build explosive devices.*

# DISASSEMBLY OF AUTOMOBILE BOMBS

1. **Classification: Restricted Technical Data.**

2. **Subject: Automobile Bombing Incidents During Which Device Disassembly was Effected.**

3. **Source: Explosive Ordnance Disposal (EOD) Team, U.S. Marine Corps, Quantico, Virginia.**
**Glendale Police Department, Glendale, Arizona.**
**Salem City Police, Salem, Oregon.**

4. **Background:** Improvised explosive devices (IED) planted in automobiles appear to be in vogue these days. Such incidents may be popular because, in our mobile society, the bomber can carry out more secretively a personal vendetta against a specific individual after studying his daily driving habits.

The vehicle's electrical system can contribute to the bomber's means; easy access, add to his opportunities; and life's rigors, provide an abundance of motives.

This bulletin contains descriptions of three automobile bombing incidents reported to the FBI Bomb Data Program (BDP). In each instance a disassembly process was used. These procedures are presented in order that trained bomb technicians can remain aware of techniques employed during actual bomb dismantling situations. Every incident is different and may necessitate the reevaluation or improvisation of procedures used by other technicians.

5. *Incident No. 1: Hoax Device Placed Under Vehicle Wheel.*

Both a warning note and a suspect package were discovered beneath the left front tire of an automobile by the owner. Within the parcel was a "bomb", subsequently determined to be a hoax containing no explosive material. The package was removed to a remote area and dismantled by military personnel. No motive for this incident has been determined.

The hoax IED was enclosed in adhesive tape and consisted of a screw, a metal rod formed into a ring, and four sections of a broom handle painted red to simulate sticks of dynamite. A 9 volt battery was also attached to the item. Two wires connected the simulated dynamite to the metal ring and screw. A portion of wire within the ring was stripped of insulation. These components comprised the initiating switch, to be closed by the pressure of the wheel over the device. Figure 1 is an artist's conception of this segment of the device.

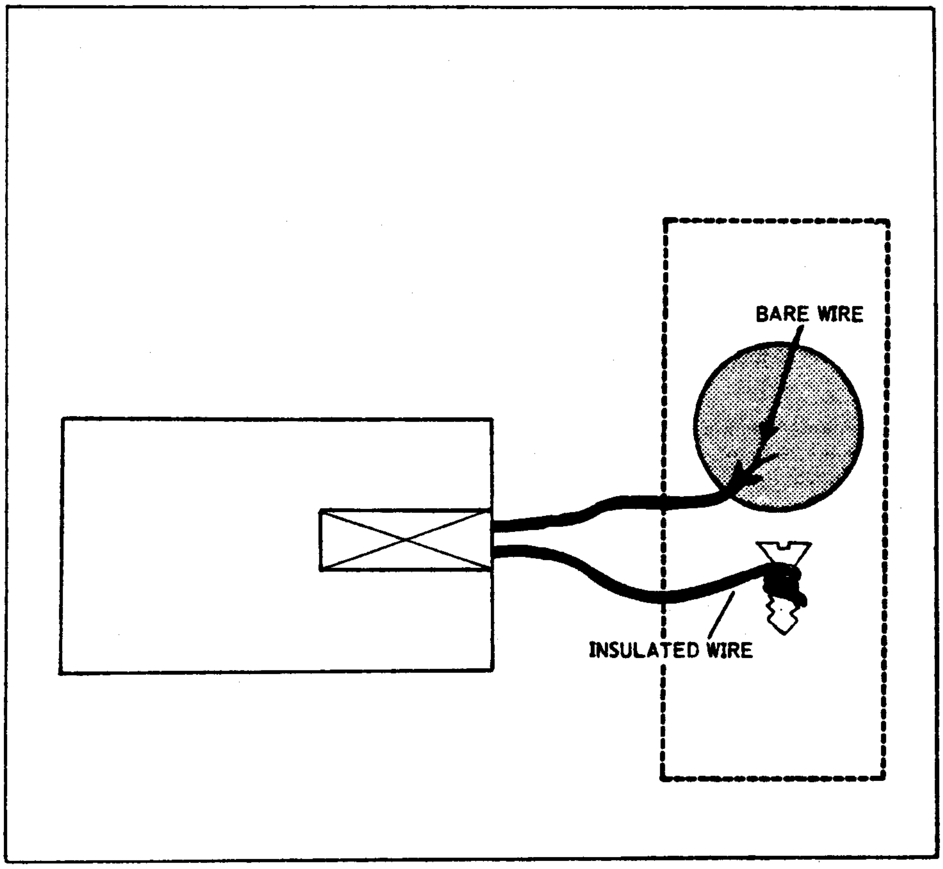


FIGURE I: ARTIST'S CONCEPT OF PORTION OF IED USED IN INCIDENT NO. I

## DISMANTLING PROCEDURE

1. The battery, which had become separated from the body of the device, was removed.
2. The IED was X-rayed and the tape carefully cut to gain access to the interior components.
3. A search for the detonator led to the discovery that the device was a hoax. It was subsequently completely disassembled.

### 6. *Incident No. 2: Pipe Device and Propane Tank.*

A pipe device contained in a shoe box was discovered by the intended victim beneath the fuel tank of his vehicle; a partially full one gallon gasoline can was placed next to the box. Law enforcement personnel were summoned. A police bomb technician examined the automobile for additional IED, covered the box with a bomb blanket and remotely removed the suspected items from beneath the vehicle. Then the automobile was moved and the technician subsequently dismantled the IED contained in the shoebox.

The device consisted of a 7 1/2 inch length of 1 inch diameter pipe and a 13 1/2 inch by 2 3/4 inch propane tank. The bottom of the tank protruded from an open end of the shoebox. The pipe was capped and filled with an unidentified powder. A bared bridge wire was inserted through one cap, resting in a small quantity of unidentified powder. There were three plastic vials, and a battery holder with four size "C" batteries within the IED.

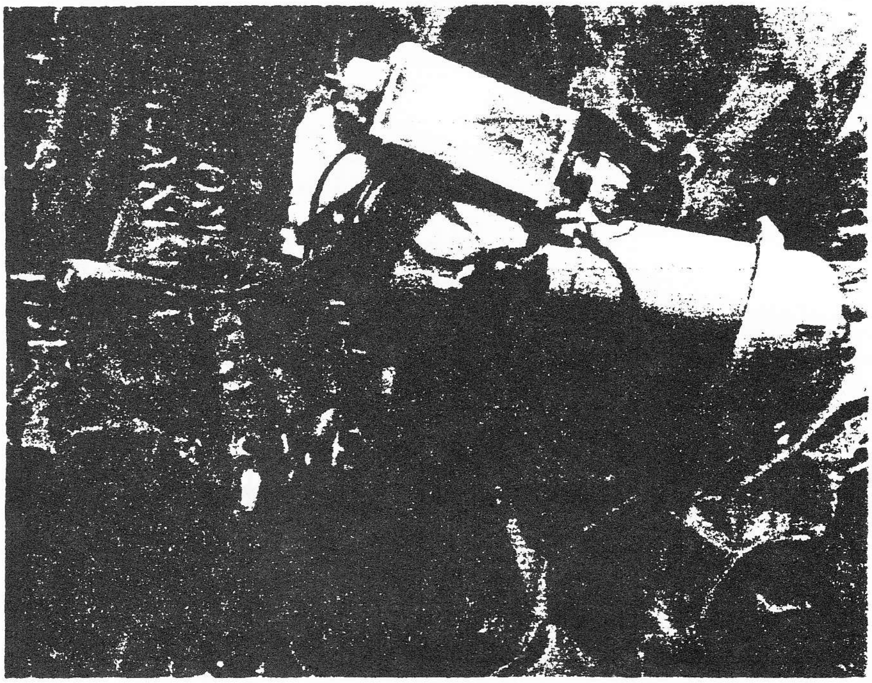


FIGURE 2: IED USED IN INCIDENT NO. 2.

A 60 minute timer was affixed to the protruding end of the propane tank. Two nails were fastened to it, one to the rotating hand and the other to the base near the "zero" marking. They were positioned to contact one another when an hour cycle had been completed. An alligator clip was attached to each nail. A wire connected one clip with the pipe bomb bridge wire. The second wire from the pipe was connected to the positive terminal of the power source. See Figure 3. This circuit was completed by a wire from the negative terminal to the second clip and nail. This connection also contained a switch, appearing to be an arming or safety mechanism. In addition, there was a line between the positive power terminal and one of the nail clips. A portion of the wire was stripped of insulation and inserted into the powder.

### DISMANTLING PROCEDURE

1. The IED, which was ticking, and the adjacent fuel can were covered with a bomb blanket while the vehicle was checked for other devices and moved.
2. The timer was visible, and its cycle appeared to be near completion. It was held still and the alligator clips removed.
3. The four batteries were disconnected and removed.
4. The partially disassembled IED was again covered with the bomb blanket and removed to a safe area for complete dismantling.

This procedure contains a practical demonstration of one of the uses of bomb handling equipment. An item such as a bomb blanket can be employed at intervals during the dismantling process to provide an added margin of safety and help contain evidence should a detonation occur. Note that in this instance the technician carefully examined and then removed the vehicle from the vicinity of the IED.

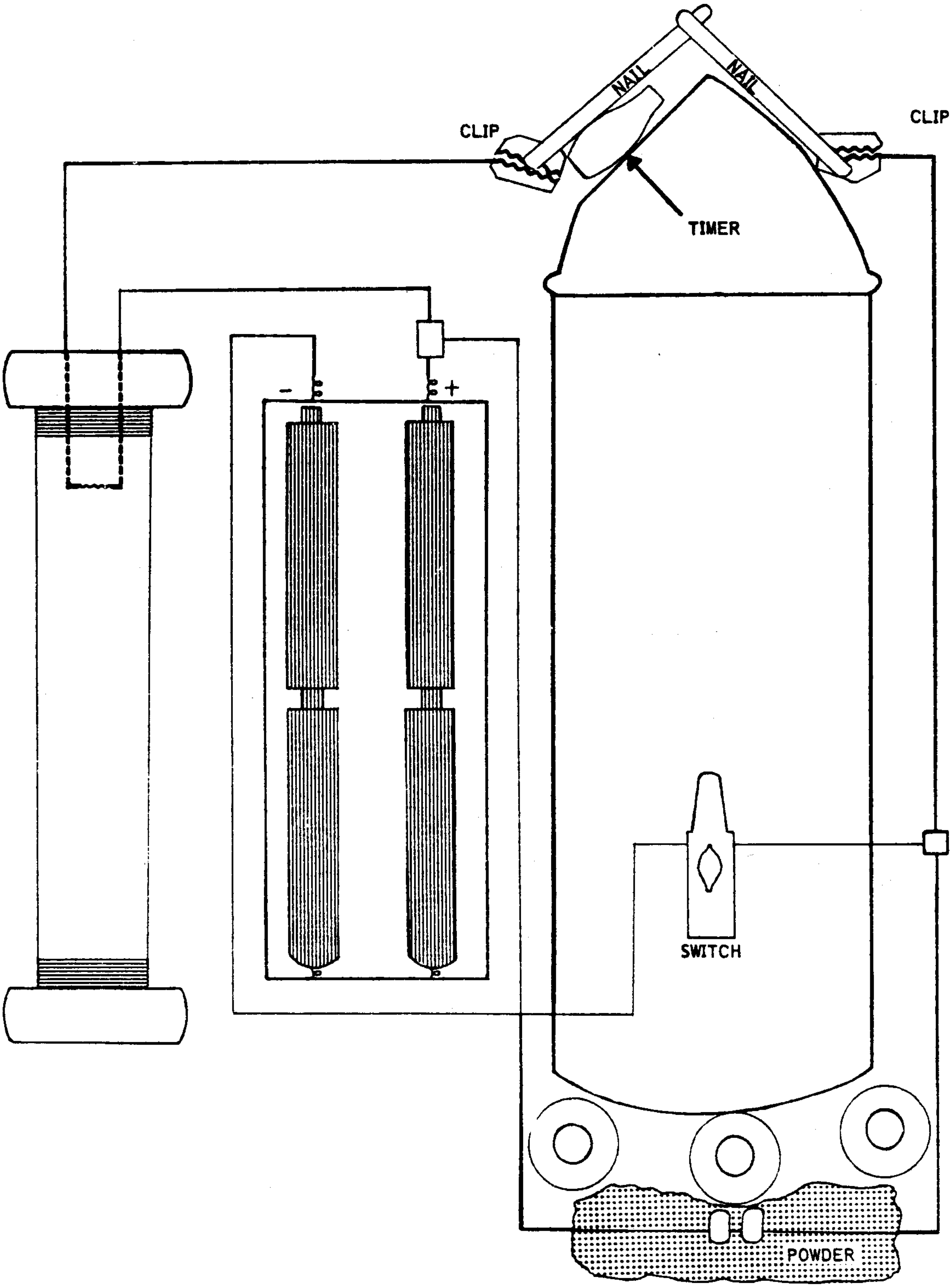


FIGURE 3: DIAGRAM OF IED USED IN INCIDENT NO. 2.

*7. Incident No. 3: Two-Part Pipe Bomb.*

A two-part IED fell from beneath an automobile while it was being driven from a driveway. The device, which included three pipes filled with smokeless powder, was partially dismantled at the scene by local law enforcement bomb squad personnel. It was then removed to a safe area for complete disassembly.

The larger portion of the device was attached to the vehicle muffler with magnets, and consisted of two 10 inch by 1 1/2 inch diameter capped pipes and the initiating components. Each pipe contained a quantity of powder and three segments of uninsulated wire, connected in parallel. These assemblies were wired into an electrical circuit comprised of a test switch with lamp, an off-on switch, a mercury switch, a thermal coil, and four size "D" batteries connected in series. The other portion of the IED consisted of a 6 inch length of 1/2 inch diameter capped pipe, also filled with smokeless powder and a trio of bared wire bridges. It was situated above the vehicle's fuel tank and wired into the common initiating system. Portions of the IED were wrapped in tape.

The lamp switch was probably used after positioning the bomb to ensure that the mercury switch was open. If the lamp did not light, the third switch could be placed in its "on" position, arming the device. This test would provide a safety check for the bomber. Heat from the car muffler was apparently intended to initiate the armed IED. The expansion of the thermal coil from this heat would shift the mercury switch enough to close it and complete the circuit.

## DISMANTLING PROCEDURE

1. Immediate vicinity evacuated.
2. The technician, wearing body armor and shield, approached the device, visually examined and photographed it.
3. To test for possible antidisturbance mechanisms, the IED was remotely tumbled, and allowed to remain upside-down for ten minutes.
4. IED remotely inserted into bomb basket and positioned in transport vehicle for removal to safe area.
5. At the dismantling site, the device was allowed to rest for 30 minutes before being remotely removed from the transport vessel and protective container, and positioned on a clay surface.
6. The fuze was separated from the main charges. A 37 mm gas gun containing 80 grams of black powder propellant was used to drive two wooden wedges through the IED. There was a standoff distance of 28 inches between the gun muzzle and the device.
7. The two largest pipes were opened remotely using a tape and line method.
8. The wires to the smallest pipe were cut at a non-soldered, taped connection before its end cap was removed.

Incorporated into this procedure were several periods during which the IED was not disturbed in any way. This is a safe practice, and should be followed whenever feasible. A bomb can be designed to detonate at a predetermined interval after disturbance, and moving a suspect item can cause accidental disconnections or contacts, leading to detonation. If a liquid component is present, this waiting period can allow any seepage to become evident.

# DYNAMITE BOMBINGS IN QUINCY, ILLINOIS

1. **Classification:** **Restricted Technical Data.**

2. **Subject:** **Dynamite Bombings in Quincy, Illinois.**

3. **Source:** **Domestic.**

4. **Background:** On September 27, during the recent presidential campaign, Senator Robert Dole made a campaign stop in Quincy, Illinois. Approximately three hours after his arrival, the first of four explosions occurred. Although early news reports hinted of a possible connection between the Vice Presidential candidate's visit and the explosions, authorities subsequently determined that the bombings were not politically motivated. A fifth blast, on September 28th, took the life of a Sergeant Major in an Army Explosive Ordnance Disposal (EOD) Unit, and injured a State of Illinois Arson Investigator.

## DETAILS

The origins of this series of bombings have been traced to September 15, 1 , when 112 pounds of dynamite was stolen from a Quincy rock quarry. Events immediately preceding the explosions began on the morning of September 27th, when two telephone bomb threats were received at a Colt Industries compressor plant during a 30 minute period. Receipt of the second threat caused the plant to be evacuated and closed for the day. Seven hours later, at approximately 3:15 p.m., a third threat was received. Searches had been conducted after each threat.

That evening, at 8:20, an explosion occurred beneath a seldom used bridge in a remote, rural area of Quincy. The improvised explosive device (IED) had been placed in a brick retaining wall. The blast left a three foot diameter hole in the retaining wall. Due to the similarities between evidence found at this blast scene and components found following later bombings, investigators hypothesized that this explosion may have been a test of the explosive devices which were to be used later that night.

Between 9:45 and 10:00 p.m., three explosions damaged several structures located outside the Colt Industries plant. The first occurred at the plant's water tower (see Figure 1); the second, 15 yards away at a transformer (see Figure 2); and the third at an experimental compressor, 36 feet from the water tower (see Figure 3). After the explosions, an extensive search was conducted with no other devices being located. Three other compressors were included in the search. Two of the compressors, numbers 2 and 3, were parked side by side with four feet of space between them. Number 2 had been searched at least twice; yet the following morning, 12 hours after the other bombings, a fourth IED was located in a position accessible only by entering the space that separated the two prototype air compressors.

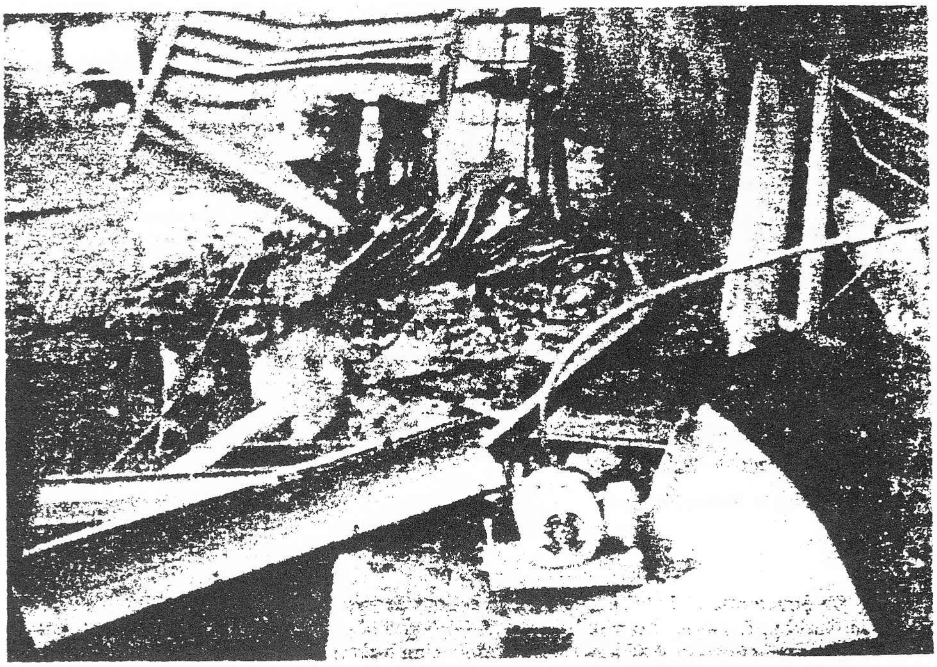


FIGURE 1: DAMAGE TO WATER TOWER

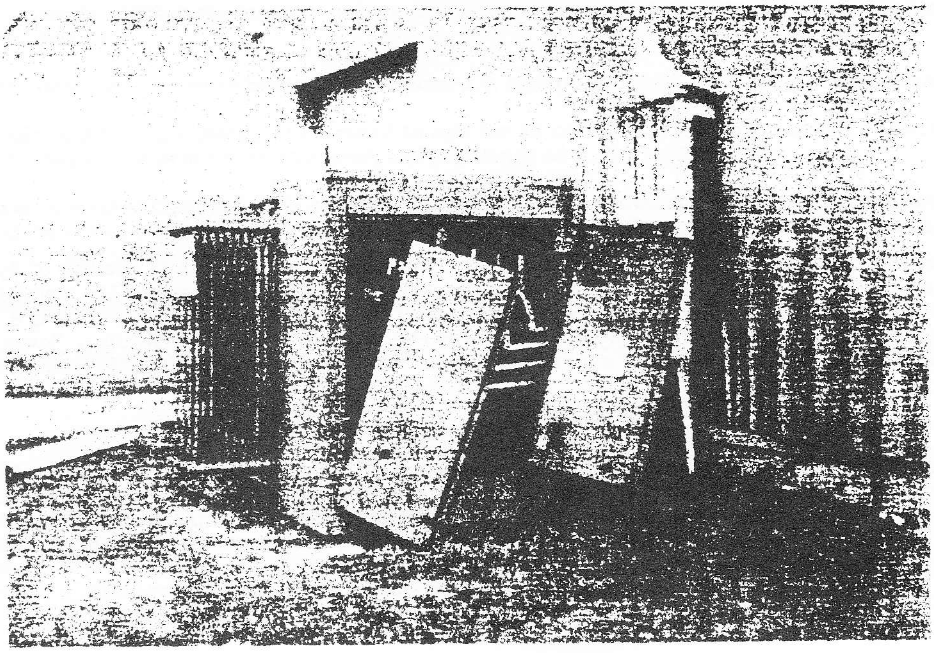


FIGURE 2: COLT INDUSTRIES TRANSFORMER

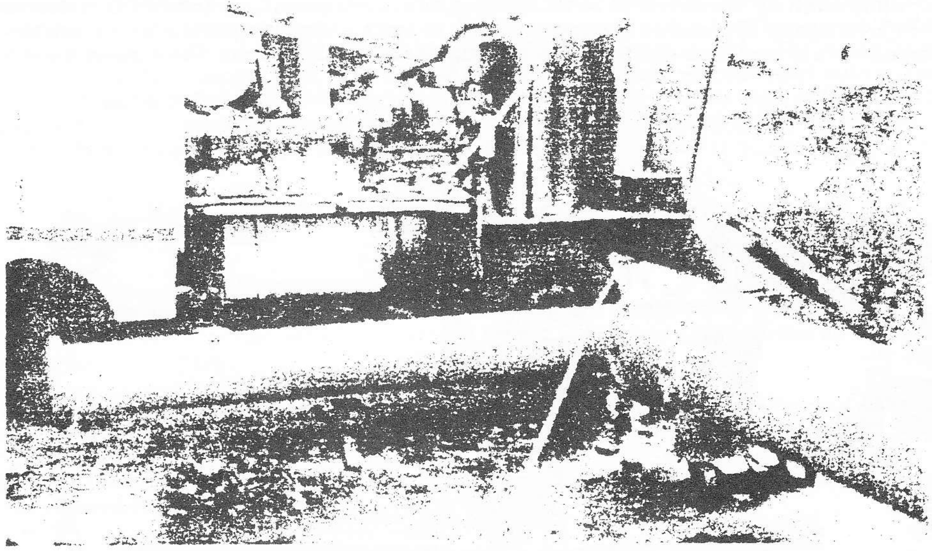


FIGURE 3: EXPERIMENTAL AIR COMPRESSOR NO. 1

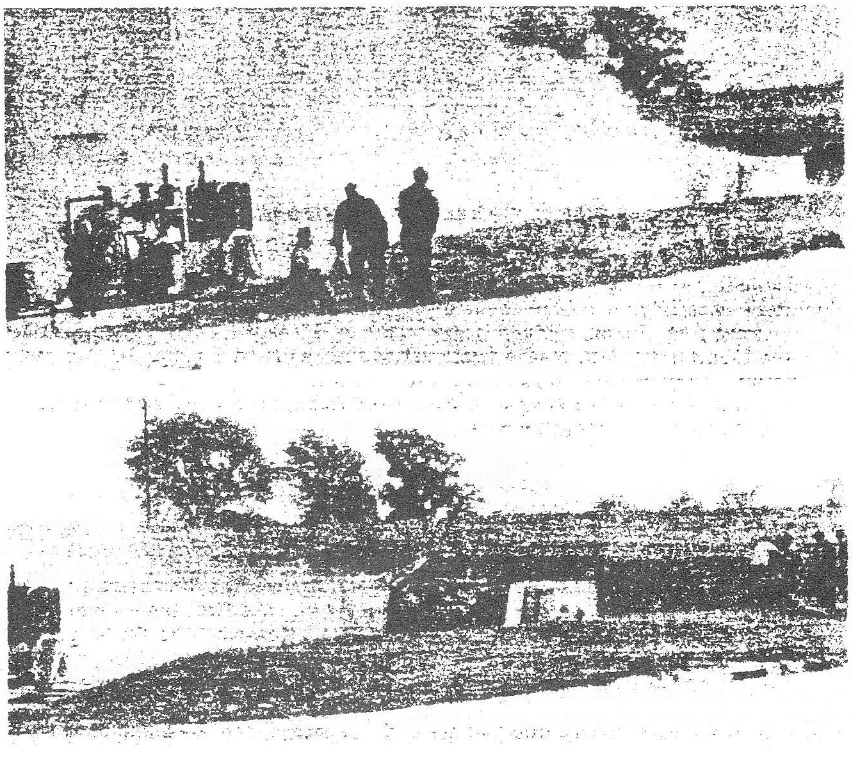


FIGURE 4: SEQUENCE OF EVENTS IMMEDIATELY FOLLOWING FINAL FATAL BLAST

At 10:50 a.m., while awaiting the arrival of bomb handling safety equipment, an Army EOD technician and a State of Illinois Arson Investigator approached compressor No. 2 to make a visual inspection of the device. In the next instant the Sergeant Major was dead and the arson investigator seriously injured. See Figures 4 and 5.

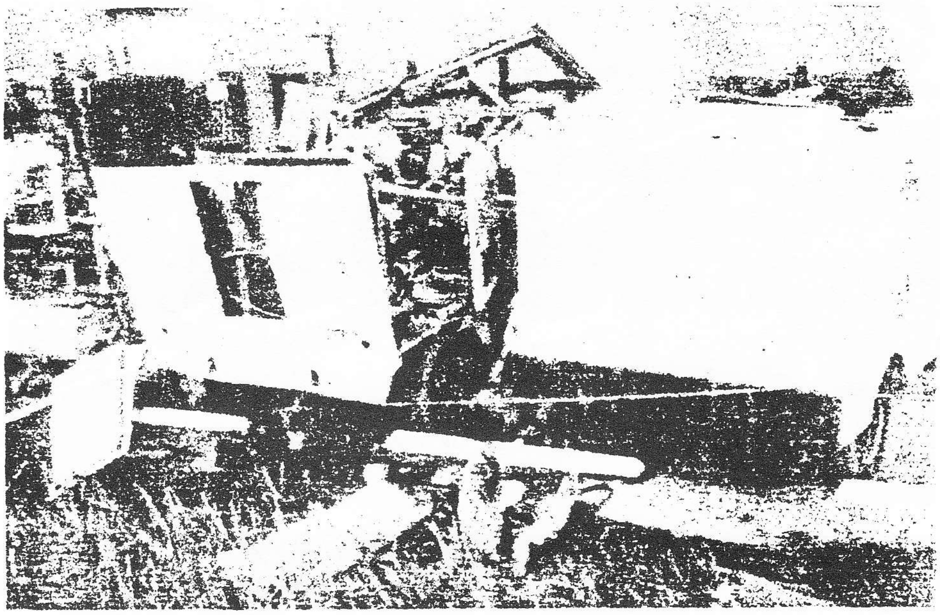


FIGURE 5: DAMAGE TO COMPRESSORS 2 AND 3

Authorities moved quickly, arresting three men in connection with the bombings. Before the week had ended they had also located a carefully concealed cache of explosives in an abandoned barn not far from Quincy. Among the recovered items were four bombs, 122 additional sticks of dynamite, and nearly two dozen electric blasting caps (EBC). A trained search dog located the first part of the cache on Friday, October with the bulk of the explosives paraphernalia being uncovered two days later. Army EOD technicians dismantled the four devices on October , six days after the bombings. Investigators found evidence that bombs had been detonated outside the barn, possibly to test their effectiveness.

## TECHNICAL INFORMATION

Since it was ascertained that the Sergeant Major had not actually handled the device prior to its detonation, two possible explanations for the tragic explosion have been put forth. The first theory maintains that all the IEDs were set to explode in sequence on the night of September 27th. However, the shock from the other blasts may have caused the clockwork delay mechanism on this particular device to stop. Movements accompanying its discovery the following morning may have then caused the clock to resume functioning, ultimately resulting in detonation.

Information related by a sheriff's deputy who had hurriedly photographed the bomb upon its discovery gives credence to a second theory that the IED was somehow booby-trapped. This officer stated that he saw numerous copper wires protruding from various parts of the explosive device--more wires than should have been necessary for its operation.

Although the photo itself could not be reproduced with the clarity necessary to discern the features and components of the device, a description was obtained from two officers who saw the IED prior to detonation. The filler consisted of a bundle of five to eight sticks of dynamite bound with black tape. A six volt lantern battery, an EBC, a clockwork delay mechanism, and the copper wires comprised the remaining components. The battery and clock were also held in place with black tape.

A notebook containing sketches of circuitry utilizing an explosive, clockwork delay, and power source was found during a search of the suspect's residence. The four bombs recovered at the barn were constructed according to the notebook model, and contained a total of 30 sticks of 40% Atlas dynamite. The dynamite was taped in two bundles of six, and one bundle each of seven and eleven sticks. Each was equipped with a clock, a six volt battery, an EBC, and a Teflon nail which served as a safety pin. Two grocery bags which contained the four devices also held 15 loose sticks of dynamite. Other recovered items included one K-Mart clock, one box of Teflon covered nails, 106 sticks of Atlas dynamite, 23 Hercules EBCs, a six volt battery, and a stick of hot glue.

## COMMENT

Two of the individuals apprehended following these bombings were charged with murder, arson, conspiracy to commit arson, burglary, and possession of explosives. A third person was also indicted on all the above charges, with the exception of burglary.

Damage to Colt Industries property was difficult to assess due to the experimental nature of the compressors, the loss in production, and the expense of emergency equipment and extra security personnel. A company spokesman provided a preliminary estimate of over $450,000. As of , the injured investigator's eyesight had been restored to the extent that he could distinguish daylight from darkness. Doctors advised that his chances of completely recovering his sight were "slim".

# ELECTRONIC DELAY CIRCUIT

## ELECTRONIC DELAY CURCUIT

Source: Domestic.

At approximately 12:00 a.m., December 20, a brown paper bag, taped to the door of Almacen El Espanol (a freight forwarding operation), exploded causing moderate damage and no injuries. The incident occurred in Union City, New Jersey. A crime scene search disclosed that the improvised explosive device (IED) consisted of a 2 inch by 6 inch by 6 inch plastic box containing explosive material, horseshoe nails, a length of safety fuse slit at one end, and a nonelectric blasting cap.

A check at a similar type of business establishment in Elizabeth, New Jersey, a few hours later revealed an IED (contained in a cardboard box) hanging on the inside of a steel security gate outside a jewelry store entrance. The 54th Explosive Ordnance Detachment (EOD), Fort Monmouth, New Jersey, responded and, using a .50 caliber dearmer, disrupted the IED's electrical circuitry. Preliminary forensic study of the device by the FBI Laboratory disclosed the following components: one plain cardboard box; Atlas Power Primer dynamite; a length of knotted detonating cord; a Dupont electric blasting cap (yellow and blue leg wires); and an electronic delay circuit incorporating a Signetics #555 integrated circuit. Power was supplied by two Eveready 9 volt batteries wrapped in 3/4 inch black plastic electricians tape.

The delay circuit contained in this device is the same as those described in Special Technicians Bulletins and /1. This type of electronic configuration can be used to permit completion of an electric circuit after a predetermined time interval has elapsed. It functions through a series of integrated circuits and corollary components, and involves no mechanical or moving apparatus. There is, therefore, no visible or audible indication of the timing process. Within such a system, the #555 integrated circuit and its supportive components are comparable in function to the balance wheel of a clock. The rate of the pulse which is generated by this oscillator can be regulated like the speed adjusting mechanism of a clock.

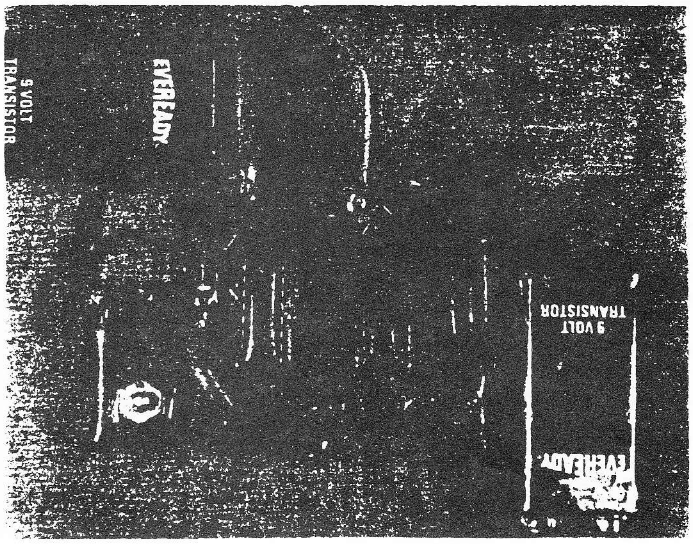


FIGURE 1: DELAY CIRCUIT BOARD

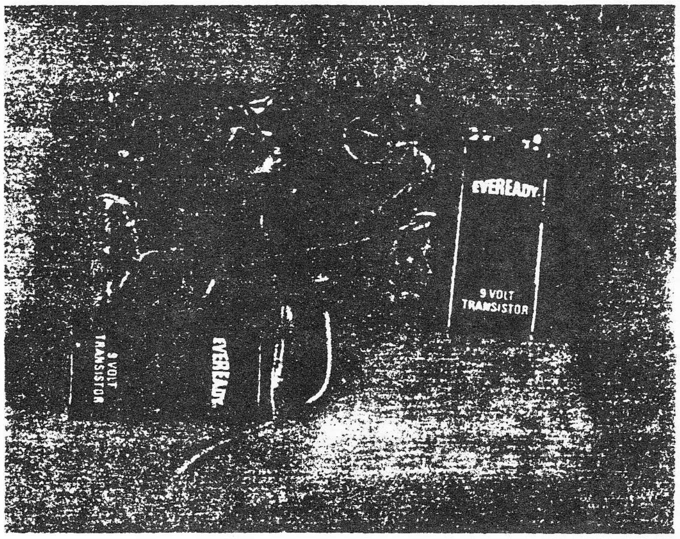


FIGURE 2: DELAY CIRCUIT BOARD--OPPOSITE SIDE

## COMMENT

The use of complex electronic timing delay systems in IED is uncommon in the United States. Reports received from foreign sources, however, indicate that integrated circuits may be employed in homemade bombs more frequently abroad.

The device described in this bulletin was safely disrupted without incident. The EOD personnel who effected the disassembly, however, did not have X-ray equipment available and were unable to see the internal configuration of the IED before entering it. If such apparatus had been available, its use might have provided an added margin of safety for the technicians.

# ELECTRONIC DELAY CIRCUIT (ADDENDUM)

1. **Classification: Restricted Technical Data.**

2. **Subject: Addendum to Special Technicians Bulletin Electronic Delay Circuit.**

3. **Source: Domestic.**

4. **Background:** Special Technicians Bulletin (STB describes a sophisticated electronic delay circuit of a type that had not been previously encountered in an improvised explosive device (IED). This addendum includes additional photographs of this item and a report on another, similar circuit, which has been reported to the NBDC as a result of the publication of STB

Figure 1 is an X-ray of the device described in STB The printed circuit pattern is obvious, as are some of the interior components of the two integrated circuits. Figure 2 shows the underside of the board with the backing removed.

**THE INFORMATION PRESENTED IN THIS BULLETIN IS PROVIDED AS ASSISTANCE FOR BOMB TECHNICIANS. THE NATIONAL BOMB DATA CENTER IS NOT RESPONSIBLE FOR PERSONAL INJURY OR PROPERTY DAMAGE WHICH MAY RESULT FROM THE DISCOVERY OR DISMANTLING OF THIS OR ANY OTHER DEVICE.**

## TECHNICAL INFORMATION

The second device, which was enclosed in foam rubber fastened with electrical tape, consisted of the metal clad printed circuit board and a plastic box, approximately 5 1/4 inches square and 1 1/2 inches deep. The device was to be exploded with an electric blasting cap, which was taped to a piece of detonating cord extending from a hole in the side of the box. The cord was knotted inside the box. The blasting cap wires were connected to the underside of the 2 inch by 3 inch circuit board. On the top of the board were two 9-volt batteries connected to battery clips and insulated from the board by a piece of foam rubber.

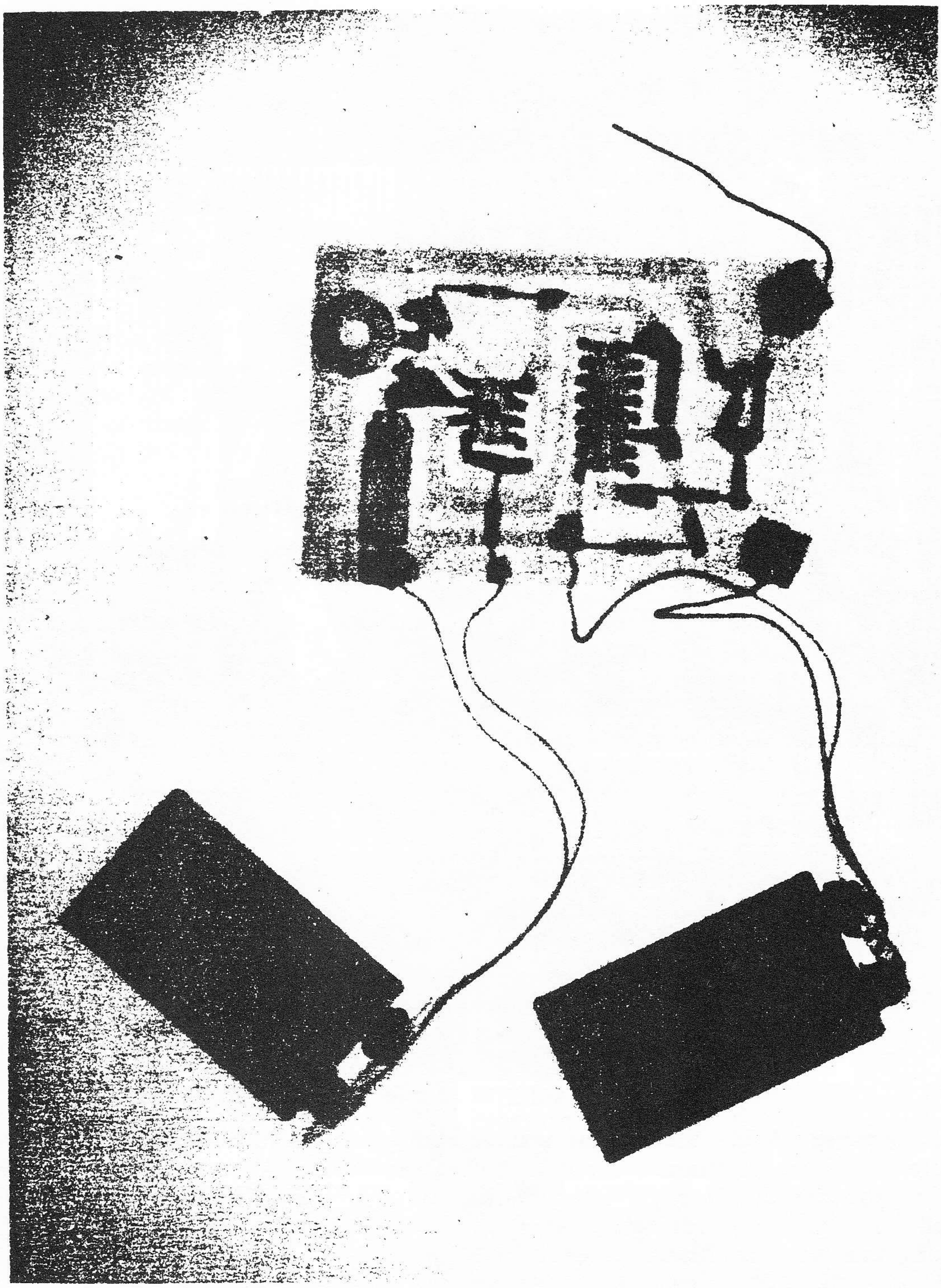


Figure 1. X-Ray of Device

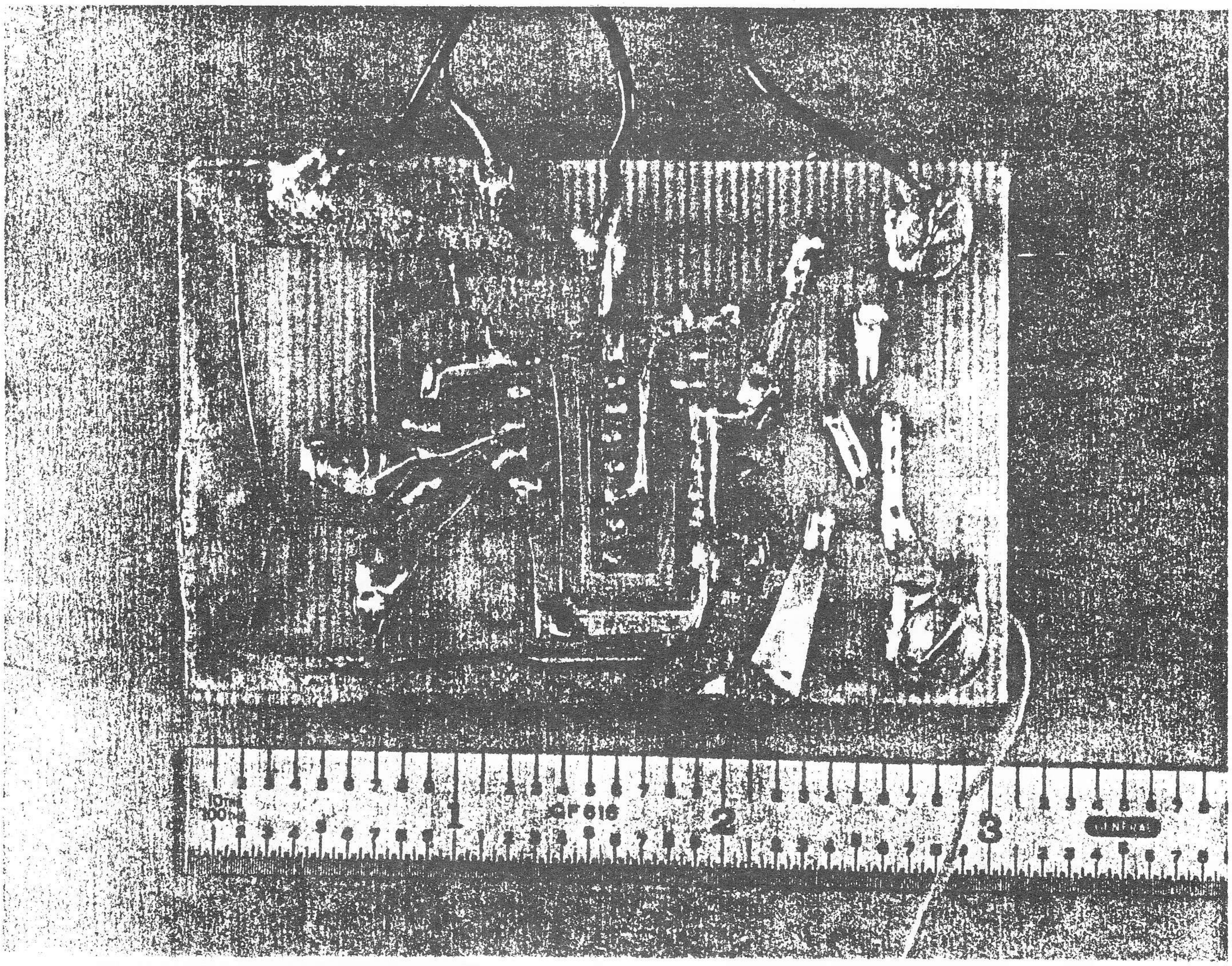


Figure 2. Underside of Device

The plastic box contained a homemade explosive material consisting of potassium nitrate, starch, wood pulp, and nitrocellulose saturated with benzine. It also contained a few nails, probably intended as shrapnel. The lid of the box was held closed with masking tape, and the circuit board and batteries were taped to the outside with electrical tape.

The functioning of the delay circuit in the second device is identical to that of the one described in STB . although there is some difference in construction; including the physical arrangement and the addition of two resistors in the timing circuit. Other components appear to be of the same type. The delay that this device would afford is calculated to be 23 hours, 36 minutes, and 32 seconds.

Delay devices of this type consist of components mounted on a piece of fiberglass board with a pre-etched metal pattern. No wires or movable parts are used. The function of such systems is to provide a delay, and has been described in STB 75-1.

Figures 3 and 4 depict the two sides of the second circuit panel. Each component is designated. It may be noted that the number 24 appears on the board. Since the delay provided by this system is about 23 1/2 hours, the notation may be a reference to the delay in hours.

## COMMENT

As this device is so similar to the first one, it may be hypothesized that the same builder was responsible for both, or that information regarding the construction of such delay devices is available from a common source.

It should be noted that the second device reported to the NBDC was actually the first one recovered. If you know of any similar devices, or should any come to your attention in the future, please report them to the NBDC promptly. The knowledge of unusual devices is invaluable to bomb technicians and investigators.

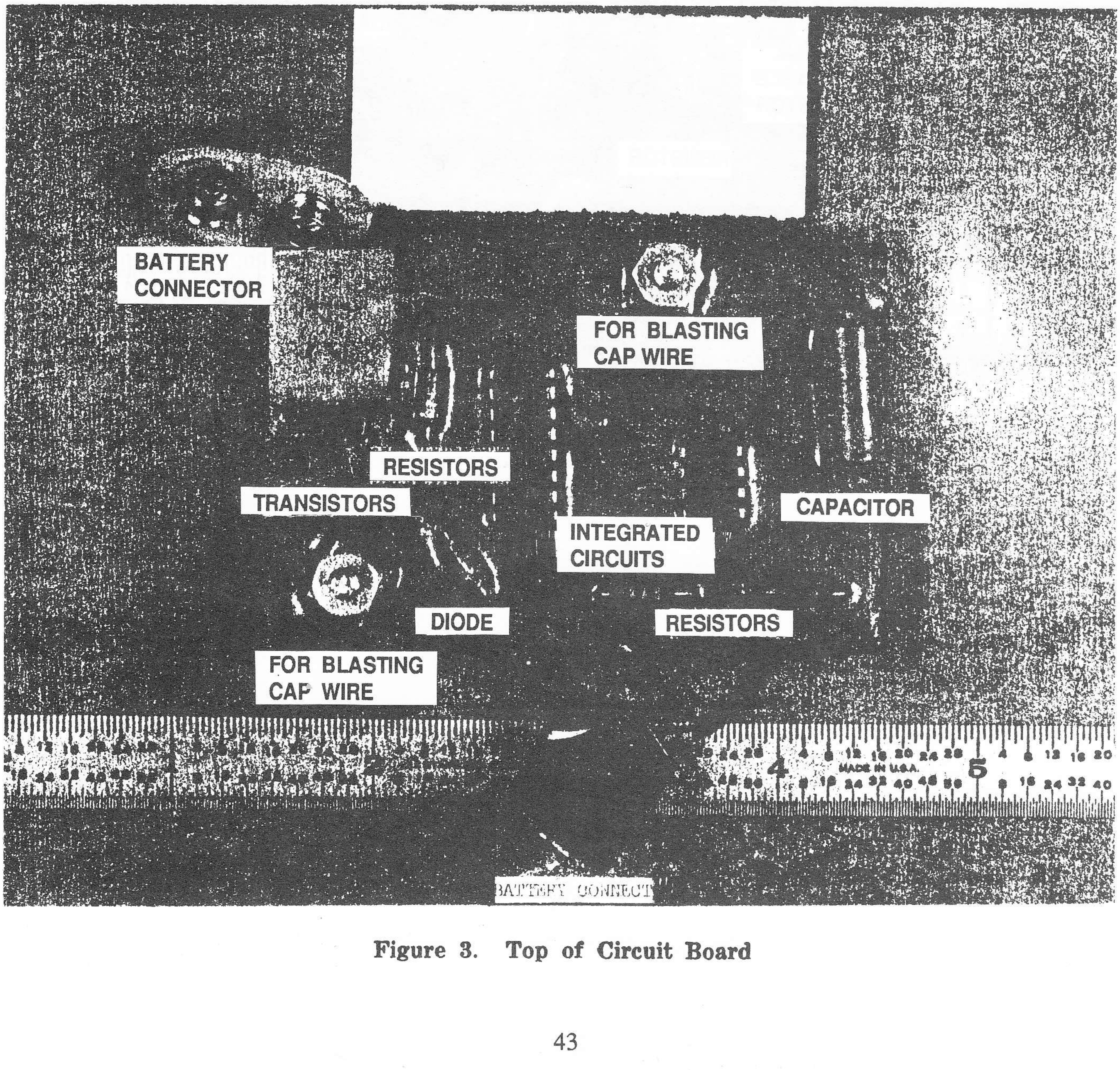


Figure 3. Top of Circuit Board

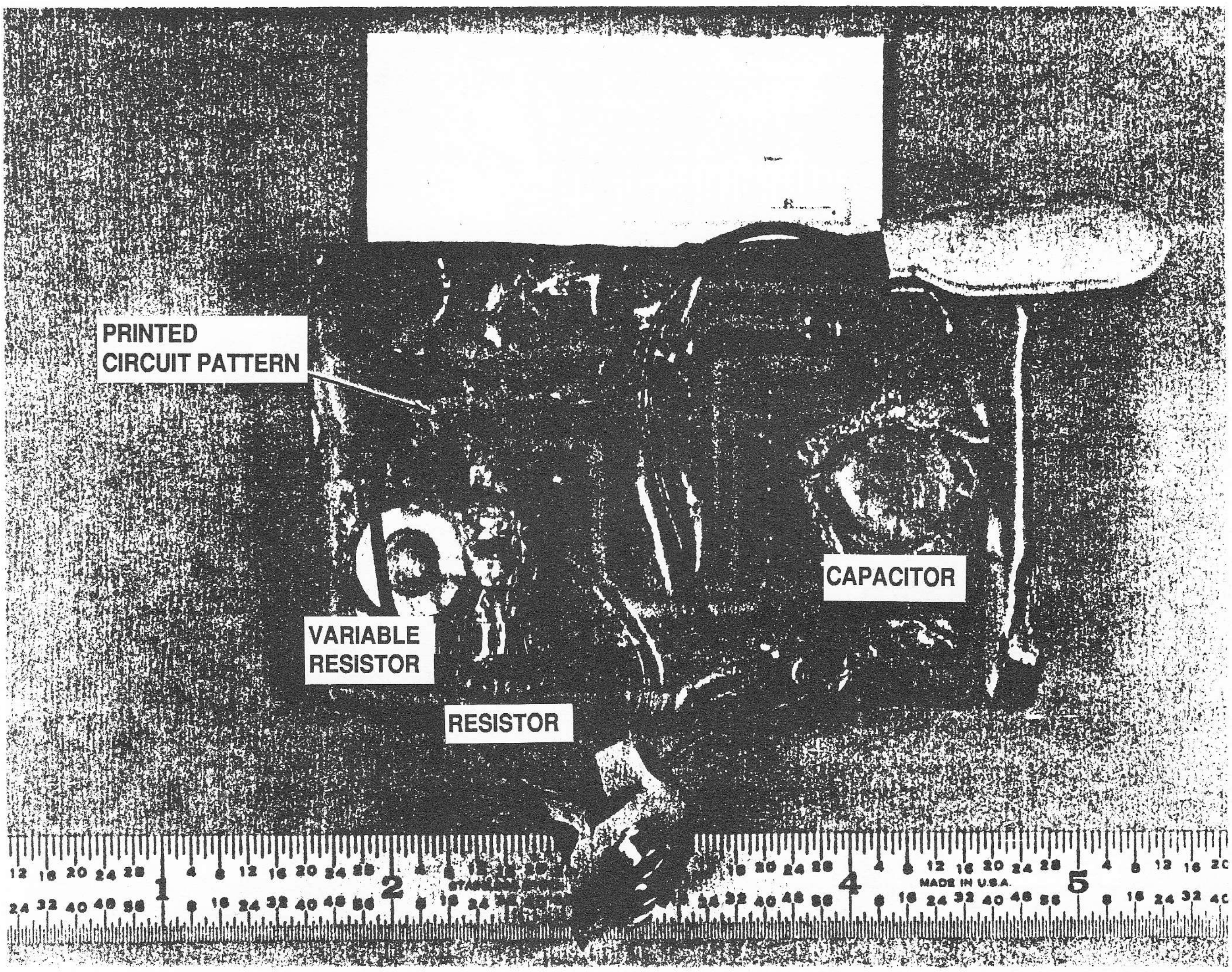


Figure 4. Bottom of Circuit Board

# EXPLOSIVE BELT BOMBING DEATHS

**DEVICES USED IN "EXPLOSIVE BELT" BOMBING DEATHS**

**Source: Foreign.**

For the second time within a period of months, death was the result of an improvised explosive device (IED) detonating after having been attached to a victim's person. The most recent incident, which occurred on January 25, in Madrid, Spain, claimed the lives of Mr. and Mrs. Viola. The IED used appears to have had elements in common with one which detonated during a May, 1 extortion case. A prominent Barcelona, Spain businessman, Mr. Bulto, was killed at that time. There has been considerable interest in these bombings and possible connections between them. The technical details cited in this bulletin deal with both cases.

The IED in each case was affixed to the body of the male victim. An IED with a pressure-release initiator was attached to the soft, lower portion of Mr. Bulto's chest. See Figure 1. Placement in the Viola case was comparable. Any movement involving contraction of the abdominal muscles could provide sufficient release of pressure to detonate a bomb so situated. There is some evidence, however, that these devices included components intended to forestall accidental pressure-release explosions.

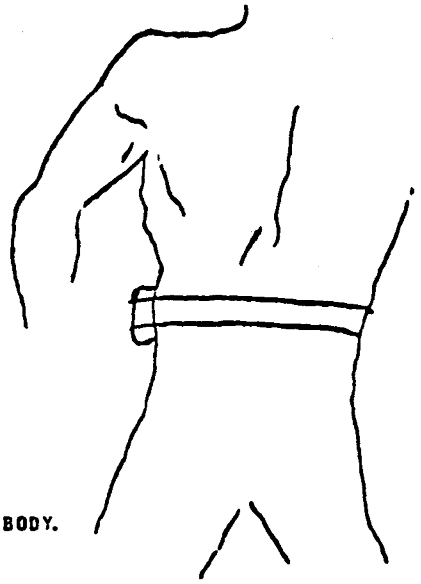


FIGURE 1: POSITION OF IED ON BODY.

In the Bulto case, the device was seen by a witness after emplacement. Evidence gleaned subsequent to the blast indicates that the detonation occurred as Bulto was attempting to remove his pants from beneath tne IED. His left arm suffered greater mutilation than did other portions of his body, and may have been near or touching the bomb. Viola's circumstances at the time of his death are less clearly defined. The effects from the detonation, however, were similar to those of the previous case. He was seated, and may have been attempting to remove the IED or complete some unrelated action at the moment of detonation. In each case, the explosion seems to have been premature and accidental. Bulto, for example, was led to believe that the item would not explode for several days. In addition, the perpetrators of the crime would hardly have intended to kill the victim before the extortion demand was met.

The Devices

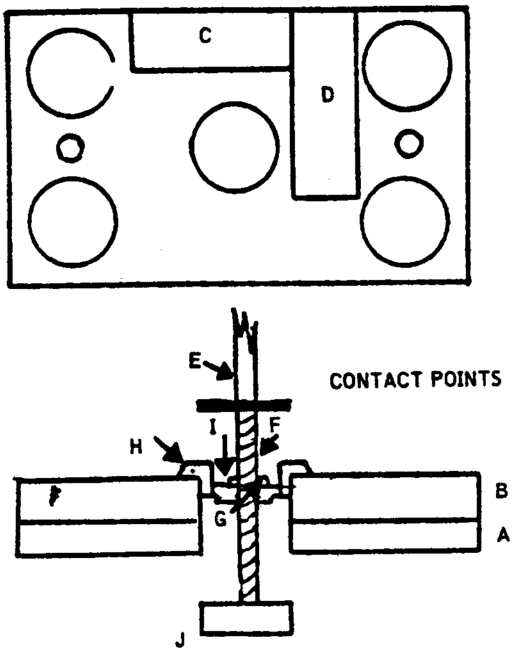


FIGURE 2: POSSIBLE CONFIGURATION OF IED INITIATING MECHANISM.

It is hypothesized that the device used in the Viola case included the following components.

- A stainless steel plate - approximately 2 1/2 inches by 1 1/2 inches by 3/16 inch. Figure 2, A.
- A transparent block (rosin, hardened glue, plastic, or similar substance) - approximately 2 1/2 inches by 1 1/2 inches by 1/4 inch. Figure 2, B.

(Both the plate and the block, which were affixed to one another, contained five large holes and two small ones. The latter ones accommodated screws fastening the item to a slightly larger external box.)

- A printed circuit board embedded in the transparent block. Figure 2, C.
- A flat relay. Figure 2, D.
- Two 1.5 volt lithium batteries. The placement of the power sources within the IED has not been specified.

- A rod - approximately 2 inches long by 1/8 inch diameter. Figure 2, E.

- A spring (Figure 2, F).

(The rod and spring assembly was encased in a plastic cylinder. Figure 2, G.)

- One stainless steel washer (Figure 2, H), and a rubber washer (Figure 2, I).

- A top at one end of the rod. Figure 2, J.

- An unspecified explosive with detonator.

It has been hypothesized that these components were used to fabricate a complex device consisting of an electronic delay initiating system buttressed with a corollary pressure-released mechanism. Such an IED can be reconstructed.

The relay housed in the transparent block could be used to complete a circuit, after a predetermined interval. In one of the present cases, this was noted by the perpetrator to be 25 days. One battery would activate the relay; the other, provide power through the pressure-release circuit.

The components of this mechanical initiating circuit were positioned through the central hole in the plate and block assembly. The cylinder retaining the rod and spring assembly was held in place with the steel washer which was anchored to the main portion of the device. The rubber washer was also used to maintain this configuration. One end of the spring was supported by a ridge in the rod; the other, by the top. The ridge also provided a contact point for the system. When the top was positioned against a surface, in these cases a human body, the spring would hold the ridge separate from the other contact on the main body of the device.

To comment on the intended operation of the circuit board, relay, and pressure release mechanism would only be speculation, as the exact functional sequence is not known.

## COMMENT

Since terrorist activity is not limited by national boundaries, bomb technicians in the United States should familiarize themselves with such IED and associated fuzing systems. Maximizing the use of precious time is essential in developing the expertise to answer effectively such challenges of terrorism.

# FOREIGN BODY BOMBS

## UPDATED INFORMATION ON FOREIGN BODY BOMBS

**SOURCE:** Domestic.

FBI Bomb Data Center (BDC) bulletins have been published over the past two years dealing with incidents characterized by the emplacement of improvised explosive devices (IED) on human bodies. Most of those reported in these documents, which include Investigators Bulletin and Special Technicians Bulletin , have occurred in a European country, in conjunction with extortion crimes. Additional information concerning two of these incidents, both of which resulted in the deaths of the victims, has been reported to the FBI BDC and is included in this bulletin.

March 21,

### Spain: Catalonian National Council Exposed as Terrorist Group

In Barcelona, Spain, authorities in mid-March announced that the solution of the previously unsolved terrorist murders of two prominent Barcelona businessmen has led to the exposure of the Catalonian National Council as a terrorist organization rather than a relatively harmless separatist group. The two victims, Jose Maria Bulto and Joaquin Viola, died in May and January respectively. Unidentified individuals seized the men and attached explosive devices to their bodies to extort money from their families (an amount equal to several million dollars in the case of Bulto). They then released the victims with instructions not to attempt removal of the devices before the extortion money had been paid. The devices involved complicated electronic circuitry which, according to the terrorists, could be deactivated by a code known only to them. Bulto went home, ignored instructions, and attempted to remove the apparatus. He succeeded only in creating a violent explosion. In the case of Viola, the mechanism malfunctioned and exploded shortly after he arrived home. His wife also died in the explosion.

At the time of Bulto's and Viola's deaths, Spanish authorities and observers of the Spanish scene were uncertain whether this approach heralded a more gruesome tactic on the part of the ETA, other terrorist groups, or a sophisticated criminal element. Information on leads to the solution of the crimes is not available, but both press and official sources have announced that the Catalonian National Council (CNC) was responsible. The group is described as being composed of university-trained persons from high social levels who were formerly led by Jose Maria Batista Y Roca, whose Catalonian nationalist political activity spanned almost 50 years. After the Spanish Civil War, he went into exile in London, where he founded the CNC and led numerous conferences and seminars in British universities on the Catalonian question. Batista Y Roca died of natural causes in Barcelona in August

Authorities are investigating the current leader and other members of the group, which, according to official sources, had planned to establish a highly sophisticated clandestine organization and to carry out terrorist activities against the Spanish Government.

# GERMAN BOMBINGS

## BOMBING INCIDENTS IN GERMANY

**SOURCE:** Foreign

West Germany was the scene of a number of bombing incidents in the last year and a half. The purpose of this Bomb Data Center (BDC) bulletin is to describe and analyze selected occurrences.

## TIMING DEVICE DISCOVERED

On June an electronic timing component was found in an apartment in Weisbaden, West Germany. The discovery followed an explosion at that same location. It is important to note that timing devices resembling the one that was discovered had been used in arson and bombing attacks in Berlin and Frankfurt. A group called the "Revolutionary Cells" took credit for those attacks.

Similar timing devices were also found in Weisbaden on September in another apartment. The electronically controlled timing devices were set up as integrated circuits with time delays ranging from 6 to 60 minutes.

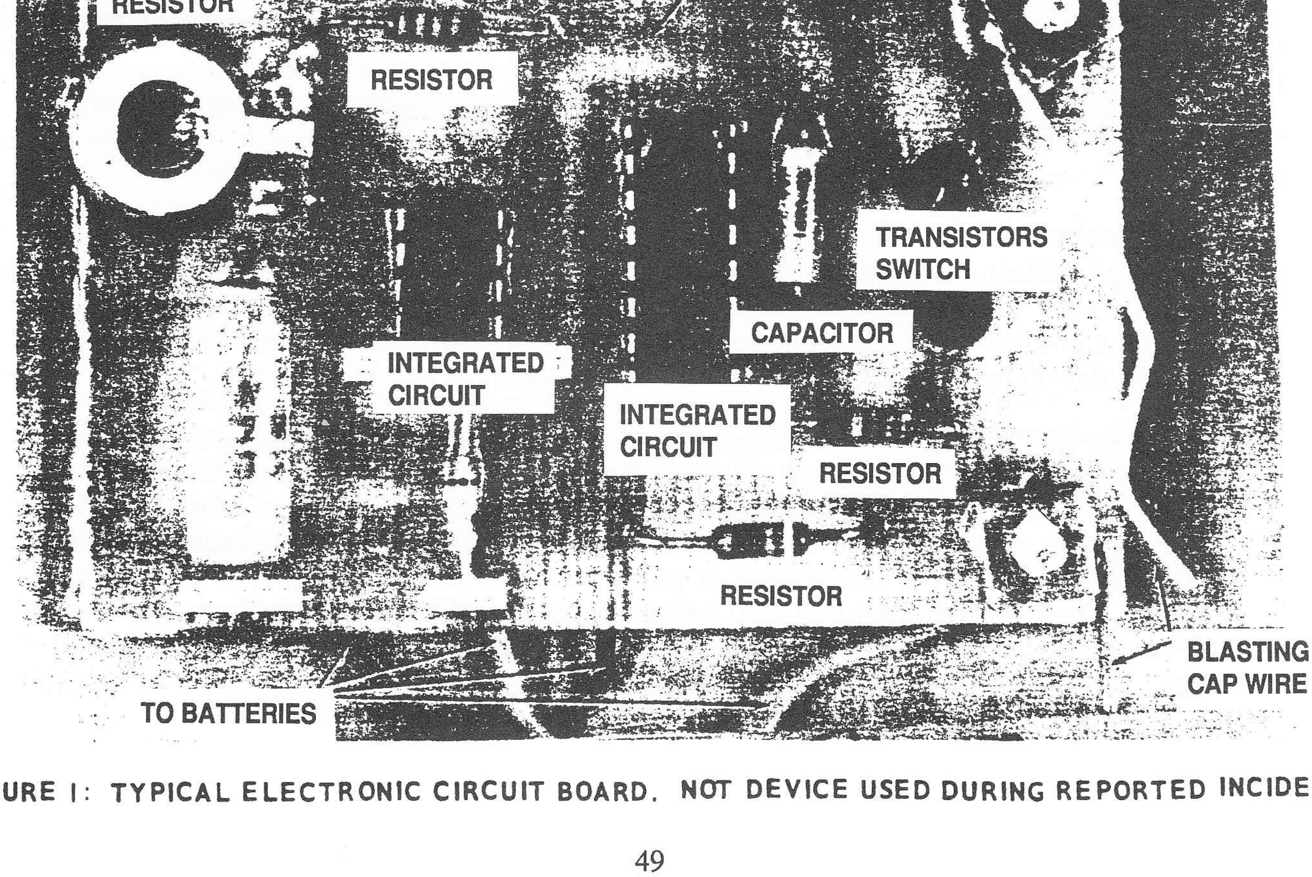


FIGURE 1: TYPICAL ELECTRONIC CIRCUIT BOARD. NOT DEVICE USED DURING REPORTED INCIDENT

The electronically controlled timing device recovered on June provided for a delay of 15 minutes, 5 seconds. Once the delay time had elapsed, the power transistor attached to the connector was switched on by the circuit. As a result of this connection the ignition circuit was completed.

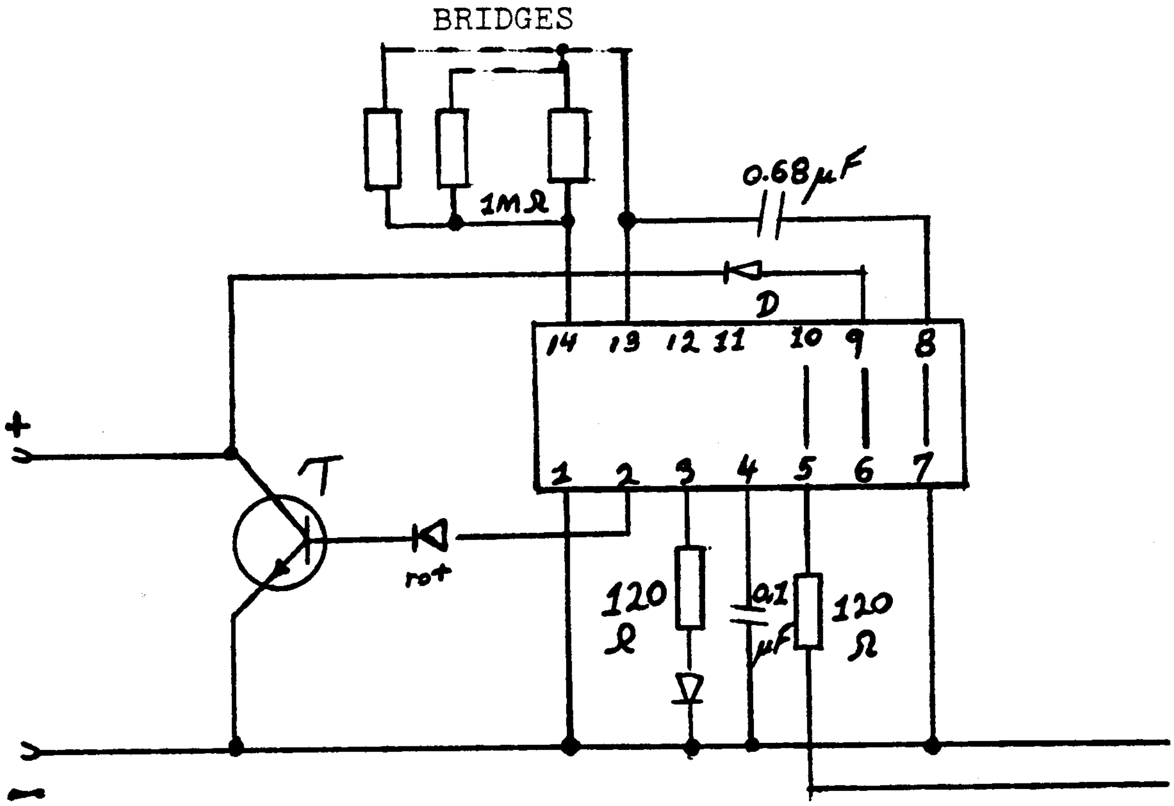


**FIGURE 2: SCHEMATIC DIAGRAM OF ELECTRONICALLY CONTROLLED TIMING DEVICE USED IN THIS INCIDENT.**

Two light diodes arranged in a series were used to indicate the progress of the circuit. Once the delay time period had expired, the green light died out and the red light signalled the ignition circuit completion. However, the green light in this case was defective causing the unintended explosion in the apartment.

The entire timing device was composed of casting resin. Four electric cables were attached to the devices for outside connections. A pair of thin cables, one black and the other red, connected the device to a 9 volt block battery. Another thicker pair of cables, provided connection to the ignition circuit. Finally, four uninsulated short electric wires were arranged in pairs to alter the delay time, if a change was desired. They ran through the cast resin surface, and by bridging them together in different ways, one could shift the delay time. For example, one pair of shunted bridge wires resulted in a delay of 7 minutes, 45 seconds; two shunted bridges shortened the delay to 5 minutes, 6 seconds.

## BRITISH ARMY BASES IN WEST GERMANY BOMBED

On the evening of August there were eight bombings at British Army installations in West Germany. The bombings took place at Bielefeld, Dusseldorf, Duisburg, Krefeld, Minden, Monchengladbach, Mulheim/Ruhr and Ratingen. No deaths were reported as a result of the explosions, but there was one injury.

At the time of these bombings no organization claimed credit for them, but in January of this year the Provisional Irish Republican Army (PIRA) said that it had been responsible for the explosions. This then, represented the first PIRA terrorist activity outside the British Isles since the PIRA letter bombings of several overseas British diplomats in 1973. The PIRA claimed that the bombings were supposed to demonstrate the PIRA's capability of attacking British Imperialism any time it so desired.

## EXPLOSIVE DEVICES DISCOVERED

Just a week after the military bases were bombed, two other incidents occurred in West Germany. On August , two explosive devices were discovered in the trunk of an automobile. The car was parked in front of British Rhine Army headquarters in Monchengladbach-Rheindalen. Both devices were deactivated by a bomb expert.

On another occasion, August , a fisherman stumbled upon 33 electric explosive detonators when he was fishing on the bank of the Rhine in Dusseldorf-Kaiserwerth. The detonators are believed to have come from the inventories of the PIRA.

## DESCRIPTION OF EXPLOSIVE DEVICES

The bombs recovered at the scenes in Bielefeld, Mulheim/Ruhr and Rheindalen were unconventional explosive devices with electronic detonation delay. The devices had been placed in bags. All indications were the explosive devices used in the other cities were of similar construction, due primarily to the similarity of the bomb fragments found at the numerous bombing locations.

The undamaged explosive devices discovered in the trunk of the automobile had been wrapped in plastic, and then placed in travel bags. Also in the trunk, were two metal canisters with 38 liters (10 gallons) of gasoline.

The explosive was comprised of a combination of sodium chlorate, sugar and nitrobenzene, weighing about 60 kg. (132 lbs). This type of homemade material is characteristic of the PIRA. Also, this explosive can be distinguished by its bitter almond smell, caused by the addition of nitrobenzene.

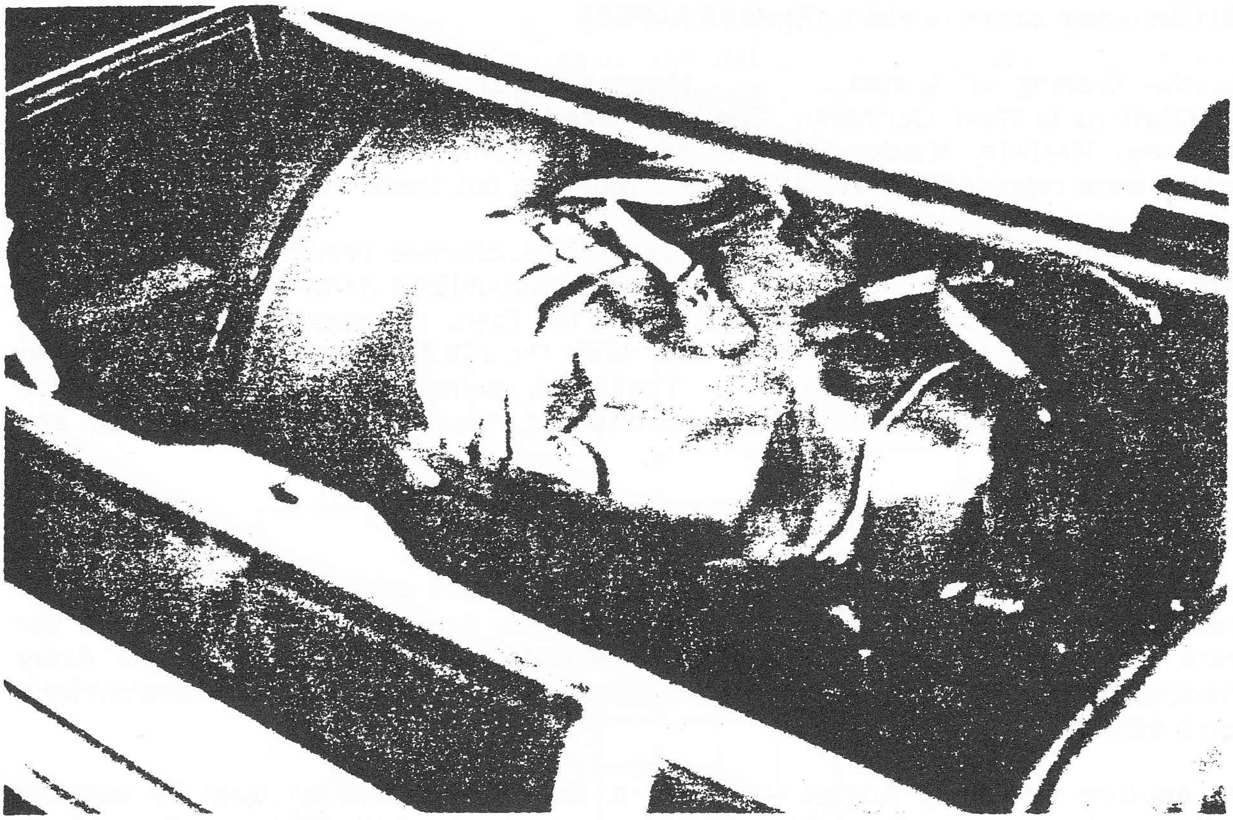


FIGURE 3: IED IN VEHICLE TRUNK

## DESCRIPTION OF DETONATION DEVICES

The detonation devices consisted of:

1. a plywood box with a fiberboard cover. This served to hold the detonation device (size approximately 145 x 80 x 35 mm).

2. six batteries in a battery pack - each one a 1.5 volt Mallory Alkaline Duracell MN 1500 - which served as the source of current.

3. a transparent box (plastic) without a top (approximately 62 x 40 mm). This served to hold the electronic time delay.

4. a bedplate with soldered-on electronic components (approximately 57 x 33 mm).

5. a flashlight bulb as a control light.

6. a wooden clothespin with 2 contacts (sketch board pegs) as safety devices. The activation pin (round rod) is missing.

7. wiring material (variously colored insulated copper wires).

8. transparent and black adhesive tape.

## DESCRIPTION OF THE ELECTRONIC TIME DELAY

The electronic time delay was comprised of an oscillator (RS combination) and a couple of delay steps. By adjusting the delay clip, delay times of 12, 24, 48 hours, etc. (doubling amounts) up to 582 days could have been attained. A reset switch, two integrated C-MOS switches and an electronic switch step were combined to function as the delay hookup. By disconnecting and then reconnecting the reset switch to the power source, the delay time would begin all over again and start from zero.

## DESCRIPTION OF THE ELECTRONIC EXPLOSIVE DETONATOR

The homemade electrical explosive detonator was identified as being characteristic of the PIRA. The explosive detonator casing was composed of copper pipe, approximately 76.6 mm long and about 14.6 mm in diameter. The sealing plugs were a synthetic plastic material. The primer capsule used was a flashbulb. The initial ignition material was about 2.6 g. of mercury fulminate. Plastic-coated copper wire was used as the detonation wire.

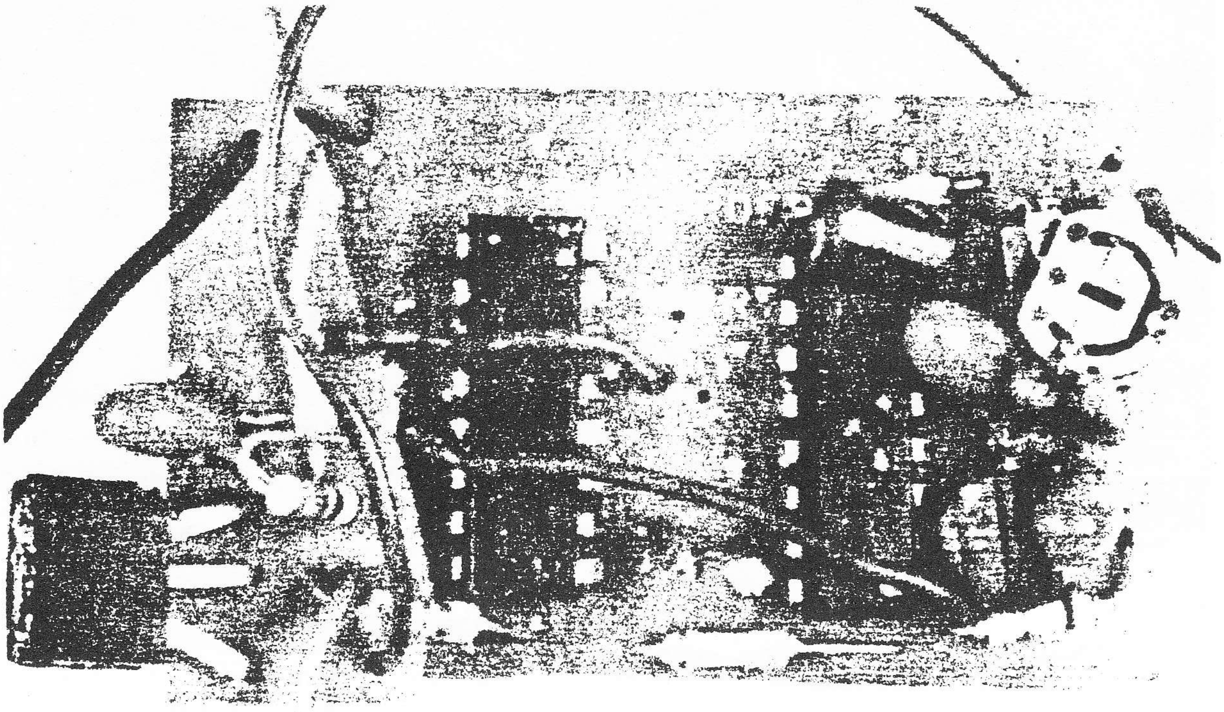


FIGURE 4: ELECTRONIC TIME DELAY

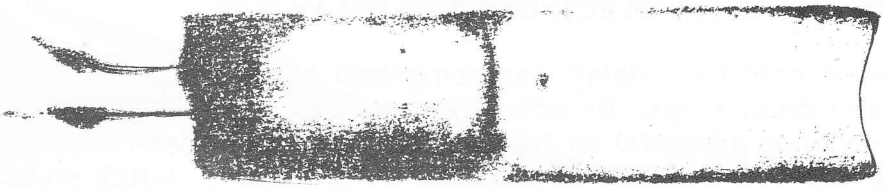


FIGURE 5: PIRA DETONATOR

FIGURE 6: DETONATION CORD ENCASED IN ALUMINUM FOIL

## NOTABLE FEATURES

A feature to be noted in reference to these bombings was the detonator cord found at Bielefeld. The detonator cord had black adhesive tape wrapped around both ends to keep the explosive material from falling out, and was also wrapped with aluminum foil all the way up and down its entire length. The purpose of the aluminum foil was to avert the nitrobenzene from seeping through the plastic casting of the detonator cord.

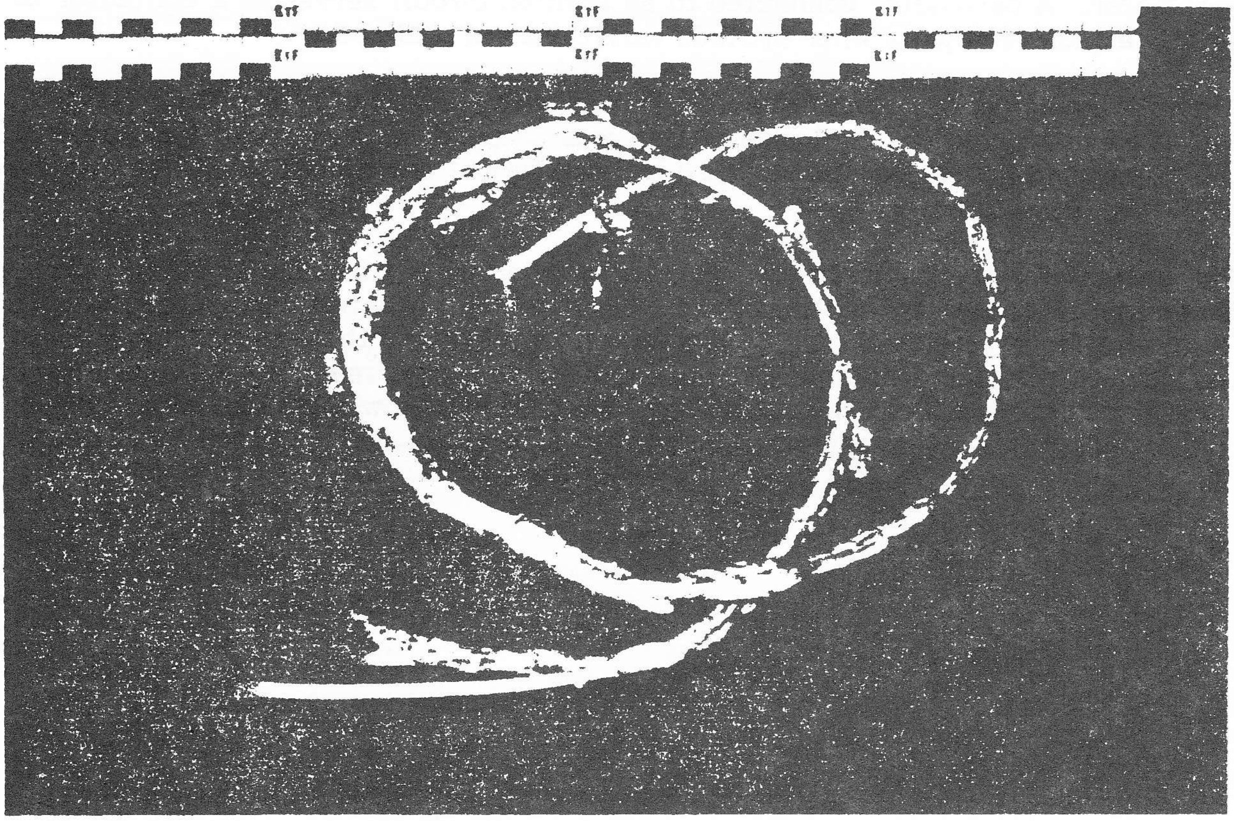


FIGURE 7: DETONATING CORD

## EXPLOSION AT LUFTHANSA AIRMAIL SHIPMENT OFFICE

On April 3 a bomb exploded in a room at the Lufthansa Airmail Shipment Office at Frankfurt's airport. Ten people suffered injuries, some seriously. The bomb was hidden in a parcel addressed to a student dormitory in Jerusalem, Israel. The parcel had been mailed on April 1 between 9:30 and 10:00 from a post office in Frankfurt by an Arab about 30 years old.

The parcel was 40-45 cm. long, 25-30 cm. high and 25-30 cm. wide. It weighed 5.9 kg. (13 lbs) when mailed, and was inscribed with the following phase on the outside of the package: "Medicine valued at 70.00 DM".

## DESCRIPTION OF EXPLOSIVE MATERIAL

The explosive material had been contained in a thin sheet receptacle measuring 160 mm x 120 mm. A lead compound is believed to have been inside the exploded package, due to the presence of a yellow substance found on objects in the immediate areas of the explosion. The yellow residue was formed through the thermal disintegration of lead nitrate. When lead nitrate is combined with deoxidation agents it can form explosive mixtures.

Also recovered from the rubble caused by the explosion were pieces of an aneroid barometer. A barometer connected to an ignition circuit serves as a contactor to set off explosive objects when altitude variations are realized.

The explosive charge detonated before it was ever loaded onto the plane. The mail sack that contained the explosive charge was dropped in the shipment office, and the atmospheric pressure was very low in Frankfurt at the time (984 millibars), thus affecting the barometer.

The current for the explosive charge was supplied by a 4.5 volt flat battery. The necessary electrical connections consisted of white insulated copper strand wire (cross sectioned area 0.75 $mm^2$). In addition to these and the other components of the device were six refillable Rowenta and Bridd lighter cartridges found at the scene of the explosion. These cartridges were combined with the explosive device to deliver a combination explosive-incendiary effort.

# HIGH-EXPLOSIVE PACKAGE BOMB

**1. Classification: Restricted Technical Data.**

**2. Incident No. 1: High Explosive Package Bomb Sent Through Mail.**

### SOURCE

Foreign.

### BACKGROUND

Police were contacted by a woman who had become suspicious of a registered package received in the mail. Police bomb technicians dismantled the package and determined that it contained a booby-trapped explosive device.

Armed by a clockwork mechanism, the device incorporated a microswitch to initiate an electrical firing circuit if the box were opened. The components were given to a forensic explosives laboratory for tests and analysis.

### TECHNICAL INFORMATION

The bomb was packaged in a heavy white cardboard box measuring 2 3/8 inches by 6 1/2 inches by 7 1/2 inches. The box was wrapped in brown watermarked paper, and addressed with a black felt tipped pen. Crumpled newspapers prevented the components of the device from shifting in transit.

The box lid consisted of two overlapping flaps secured with tape. See Figure 1. The microswitch was taped under one of the flaps. Held in the OFF position by the pressure of the taped flap, it interrupted an electrical circuit consisting of two parallel-connected detonators wired to a flat 4 1/2 volt battery. The wire connections were twisted around the tab-like battery terminals and the tabs were folded back over the twisted wires.

The two electric detonators were improvised from No. 6 nonelectric blasting caps. See Figure 2. Each aluminum blasting cap shell was primed with powdered matchheads. Inserted in the improvised primer composition was a bridgewire (a small U-shaped platinum wire) soldered to the bared wires on one end of a length of insulated, double-strand electrical wire, similar to lamp cord. The electrical wire was wrapped with cotton padding and tape to form a tight fit in the open end of the nonelectric blasting cap shell.

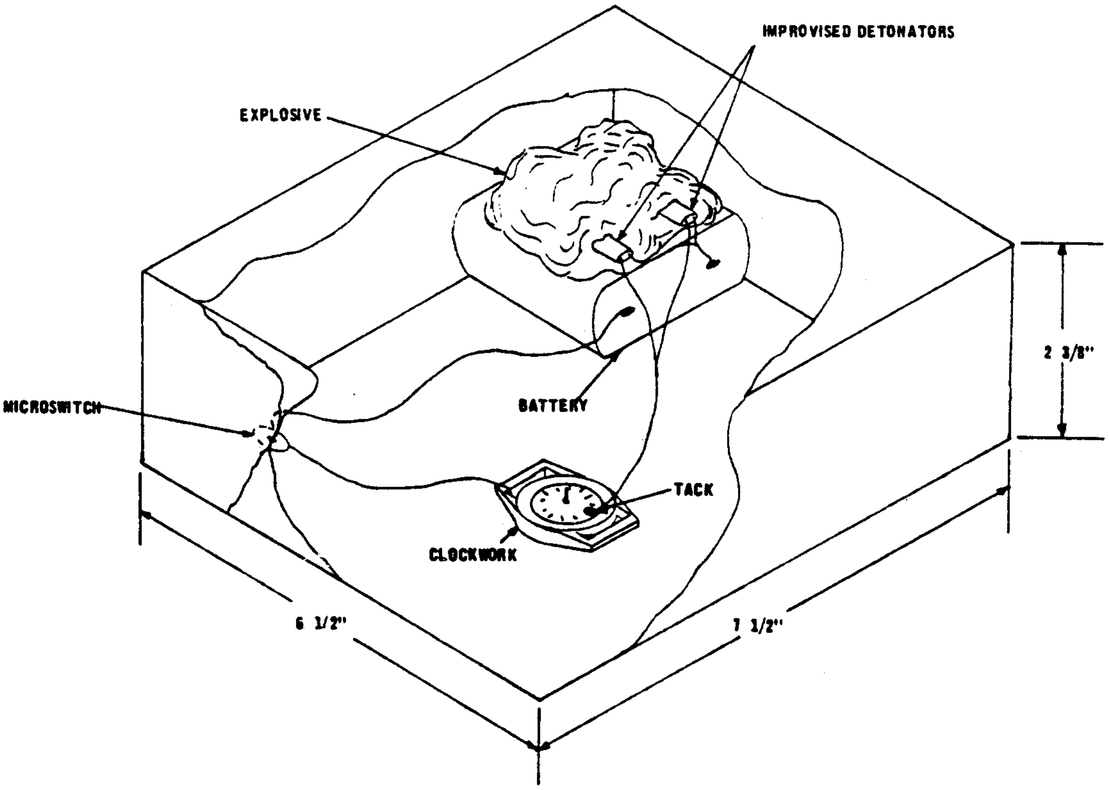
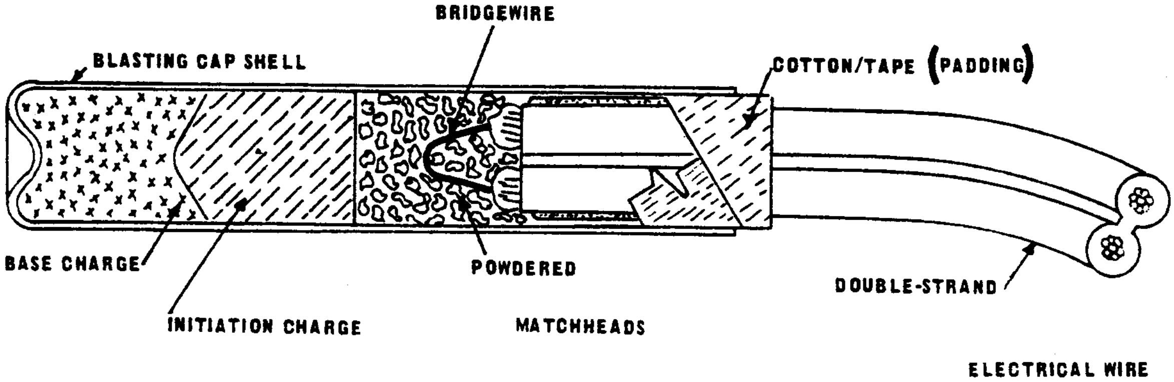


FIGURE I: ARTIST'S CONCEPT OF DEVICE



Both modified detonators were connected electrically in parallel and inserted into an explosive charge taped to the side of the battery. The explosive material, wrapped in polyethylene, weighed 2 3/5 ounces and appeared to be dynamite. A 3-inch length of detonating cord was molded into the explosive to add to the blast effect.

A wristwatch, with the minute and second hands removed, was wired into the electrical circuit and used to arm the device. A thumb tack, with the point removed, served as a contact pin. It was inserted through a hole in the lens at the 6 o'clock position. Wires incorporating the watch into the electrical circuit were soldered to the head of the tack and to the chromium-plated watchband spring bar.

The complete electrical circuit is diagrammed in Figure 3.

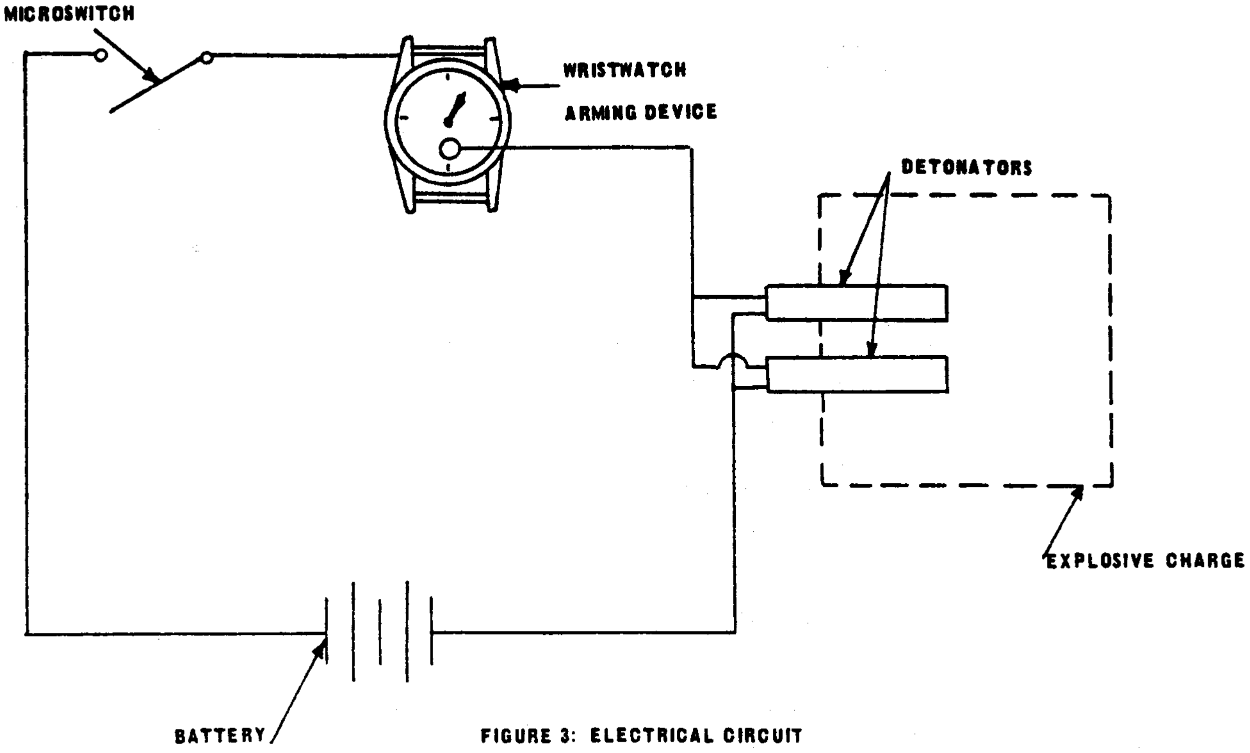


FIGURE 3: ELECTRICAL CIRCUIT

## COMMENT

Evaluation of the device indicated that all electrical connections, including the arming wristwatch, were found to be in working order and the battery was charged. The microswitch would have operated, completing the electrical circuit, had the package been opened routinely and the lid lifted as much as 1/16th of an inch. This also shows the ease with which a nonelectric blasting cap can be converted into an electric initiator.

## 3. Incident No. 2: Improvised Explosive Devices (IED) in Candy Boxes.

### SOURCE

Domestic.

### BACKGROUND

Two members of the San Francisco Board of Supervisors received packages in the mail at their residences. The officials became suspicious and bomb units were notified. Prior to the incidents, a list of demands was sent to the supervisors by the "New World Liberation Front," threatening them if the demands were not met.

### TECHNICAL INFORMATION

The devices each consisted of a commercial cardboard candy box 10 1/4 inches long by 5 inches wide, and were packaged for mailing, with appropriate addresses.

The candy boxes contained a 9 volt battery, 1/2 stick of dynamite, a mousetrap, one flashbulb, some matchheads, 2 1/2 inch length of safety fuze, a nonelectric blasting cap, connecting wires, duct tape, and pieces of candy individually wrapped in cellophane.

The 9 volt battery was connected to the flashbulb and mousetrap with lead wires. See Figure 4. The mousetrap was held in the open position by pressure of the box lid.

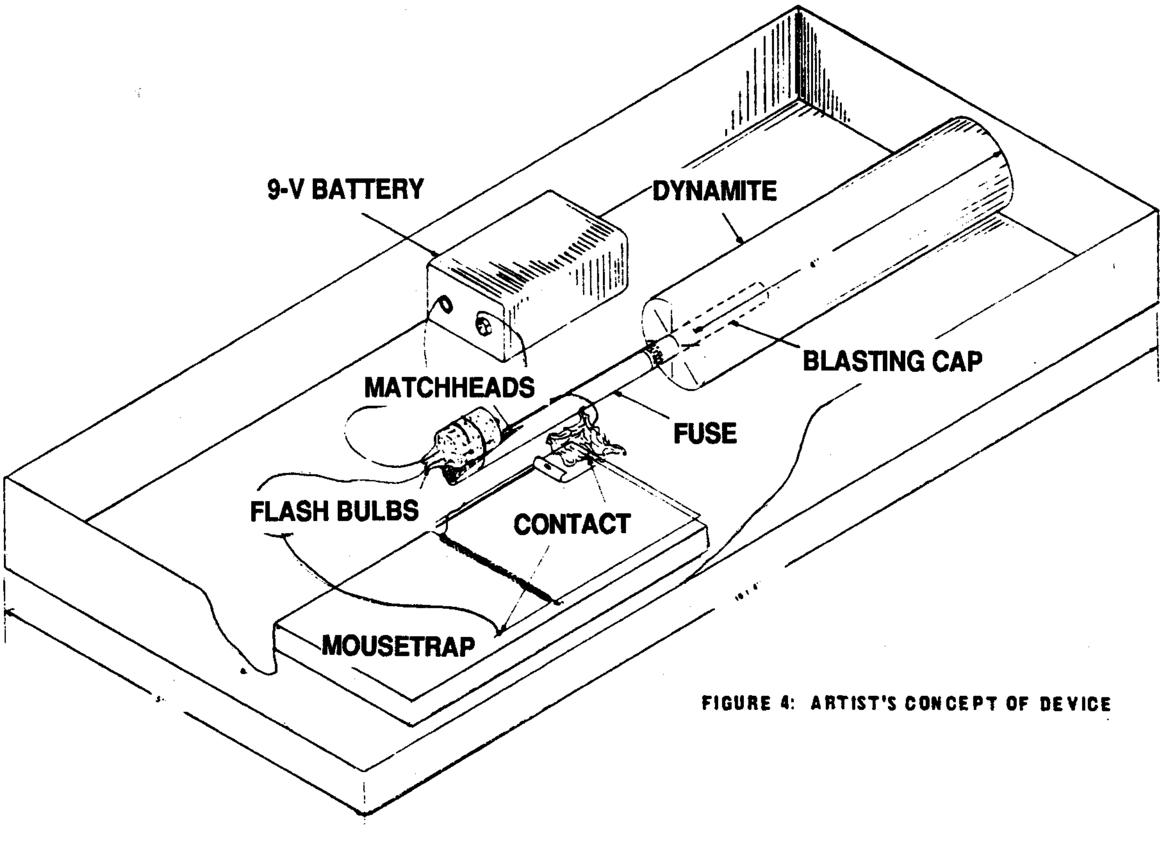


FIGURE 4: ARTIST'S CONCEPT OF DEVICE

The improvised firing train is unusual in that it employs both an electric and nonelectric fuzing system. The former consists of a 9 volt battery connected to a flashbulb with a set mousetrap serving as a pressure release switch. Upon activation, the heat from the flashbulb ignites the black powder core of the split safety fuze, thereby initiating the nonelectric portion of the improvised firing train. The safety fuze initiates the nonelectric blasting cap which is inserted into the main charge (dynamite).

## DISARMING/DISMANTLING PROCEDURES

**THE FOLLOWING PROCEDURES WERE USED TO DISARM THE DEVICES AND ARE PROVIDED AS GENERAL INFORMATION, NOT AS DEFINITIVE RENDER SAFE/DISMANTLING PROCEDURES. THERE ARE NO SAFE PROCEDURES FOR DISASSEMBLING HOMEMADE INCENDIARIES OR EXPLOSIVE DEVICES SINCE FUZING VARIATIONS ARE LIMITED ONLY BY THE IMAGINATION AND RESOURCES OF THE BUILDERS.**

### Disarming Procedure Used for First Device

The two man method for render safe operations was implemented. The bottom of the box was secured to the floor of the building by tape, and a line secured to the lid by tape. The lid was removed remotely by pulling the line from behind a wall. Inspection of the box indicated that the mousetrap switch had already been triggered. Completion of the circuit was prevented by a portion of cellophane lodging between the contact points.

The battery was removed from the circuit by cutting the connecting wires after a tongue depressor was placed between the trap contacts. A scalpel was then used to slit the stick of dynamite to remove the blasting cap and fuze from the main charge.

### Disarming Procedure Used for Second Device

The second device was discovered outside, next to a wooden fence with two large rocks on top of the box. One end of the box was open, exposing a side of the battery. The lead wires connected to the battery were against the side of the box adjacent to the fence.

One technician held the box with the rocks in place while the box was turned away from the fence by the second technician to provide access to the battery side of the box. A scalpel was used to cut a four inch section from the side of the box exposing the battery lead wires. A section of wire was removed with side cutters. Forceps and a line were attached to the box lid. The lid was then removed remotely. The battery was removed and disconnected. A scalpel was used to remove the blasting cap, fuze and flashbulb from the main charge.

### COMMENT

Although each device appeared to be identical in construction, circumstances dictated a different disarming procedure be used in each instance.

# HOAX DEVICE WITH MULTIPLE CIRCUITS

1. **Classification: Restricted Technical Data.**

2. **Subject: Hoax Device With Multiple Circuits.**

3. **Source: Domestic.**

4. **Background:** A security officer at an amusement park in the Midwest recently received an anonymous telephone call about midday. The call prompted a search which ultimately led to the recovery of an unusual improvised explosive device (IED) from a locker on the park premises.

The inoperative device had been planted as part of an extortion plot. A letter found with the device asserted that two other similar IED were located in the park and that they would explode unless the extortionate demands were met. A search revealed no other such items.

The device was housed in a metal box. See Figure 1. It consisted of a container of explosive filler to be detonated with a homemade electric squib, and a variety of initiating switch mechanisms.

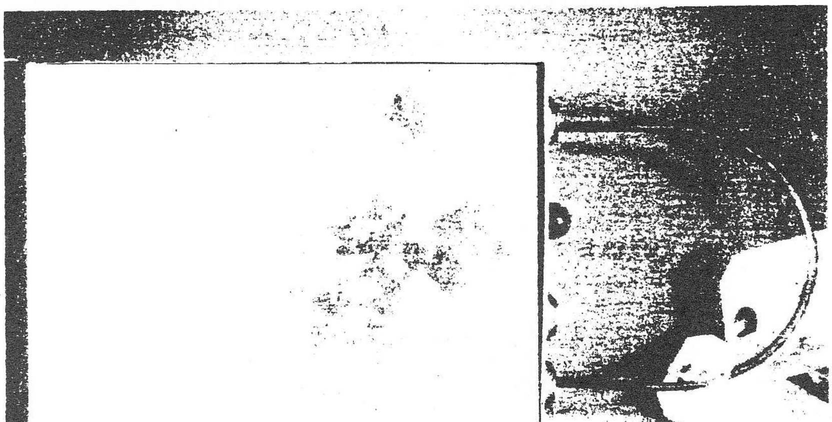


FIGURE 1: EXTERIOR OF DEVICE

## TECHNICAL INFORMATION

The device was enclosed in an 8 inch by 6 inch by 3 1/2 inch metal box, one end of which contained six key-operated switches, a three-way toggle switch, a test lamp, and a .156 inch diameter brass rod. See Figure 2. The rod, both ends of which were attached to the box, served as an antenna for the radio-controlled initiating mechanism.

The interior components of the device included: a quantity of black powder in a molded epoxy cylinder; a homemade electric squib inserted into the powder; six 1.5 volt batteries wired in series; a mercury switch; a clockwork delay switch; a microswitch; a radio-controlled servo switch; and the necessary connective hardware and wiring. All the components, except the cylinder, are commercially available. The cylinder, which was fabricated from an epoxy material containing metallic aluminum filler and cast around a glass bottle, is rather unusual.

Figure 3 is a circuit diagram of the four switch mechanisms as they would appear if properly assembled. Each circuit would be completed by a different circumstance. The mercury switch would close when the device was shifted from its horizontal position. The clockwork delay circuit would be completed after a preset time interval had elapsed. The microswitch was held open by the box lid, and would close when it was lifted. Upon receipt of a command transmitted on the proper frequency, the radio-controlled servo circuit would be completed.

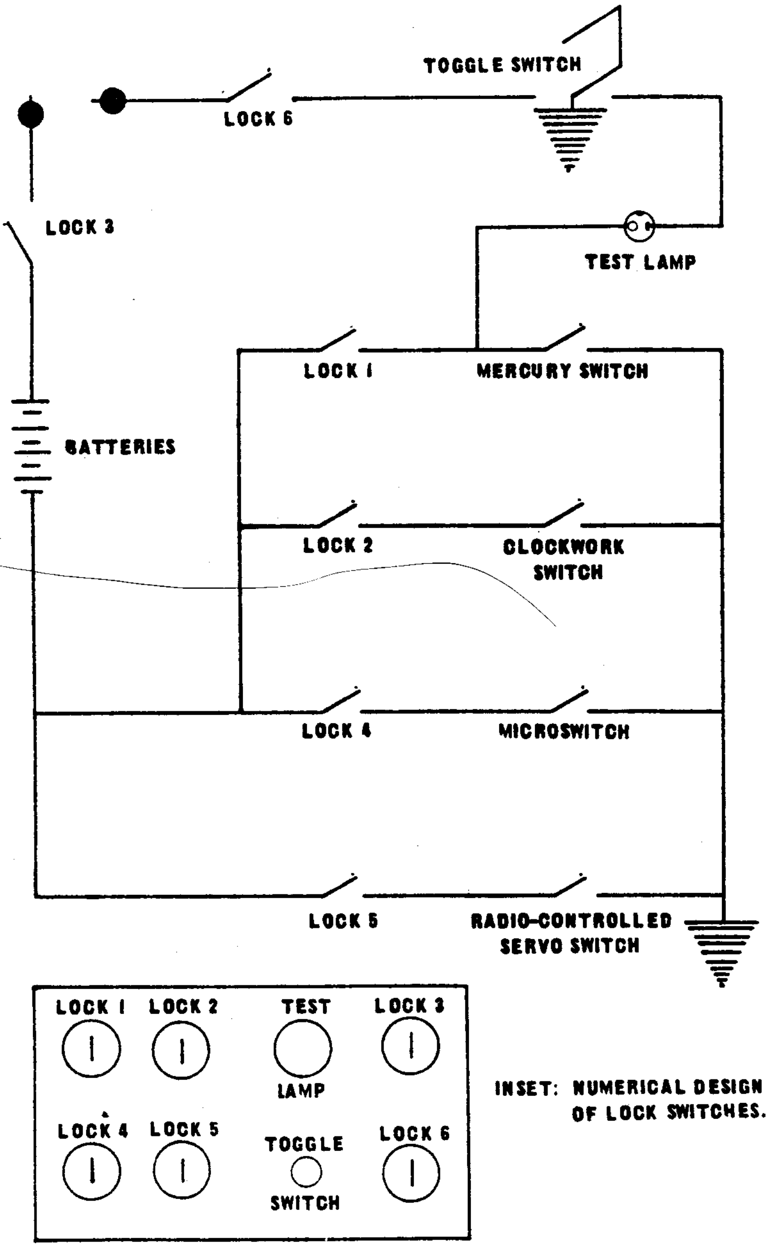


FIGURE 3: SCHEMATIC DIAGRAM OF THIS TYPE DEVICE

The six lock switches mounted on the box end all served as part of the arming system for the device. One key will not operate all of the switches. Four of them were connected in series to the four interior switches. The other two, locks three and six (see Figure 3 for numerical designations), were wired directly to the leg wires of the squib. The others were attached as follows: lock one to the mercury switch; two, to the clockwork delay system; four, to the microswitch; five, to the radio-controlled servo. The toggle switch mounted into the box served two functions: to arm the device, when in the left position (toward lock five); and to light the test lamp, when in the right position (toward lock six). The antenna was connected to the receiver inside the box.

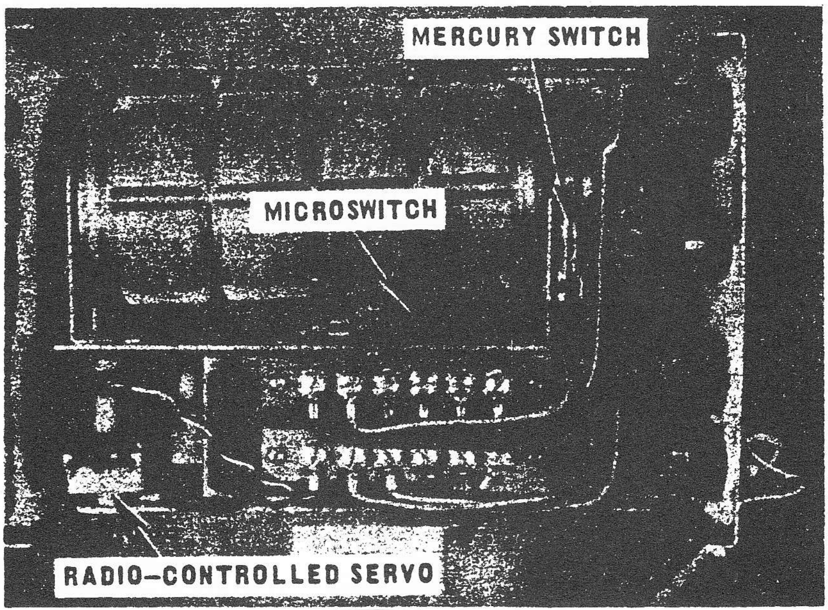


FIGURE 4: INTERIOR OF BOX – TOP

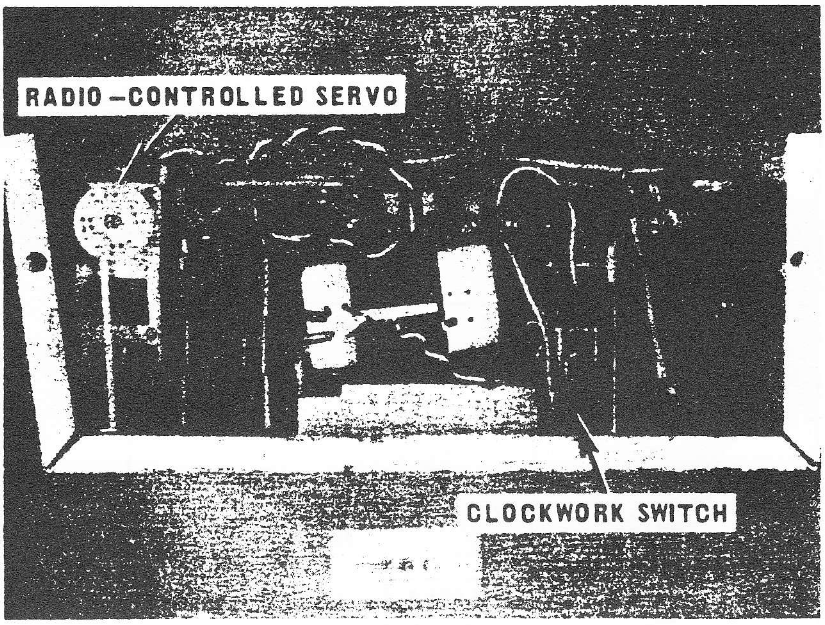


FIGURE 5: INTERIOR OF BOX – SIDE

Figures 4 and 5 are different views of the interior of this IED. In Figure 4 the mercury switch is clearly visible directly to the right of the serrated cylinder of explosive. The microswitch is also visible in the center of the photograph, and the top of the radio-controlled servo appears in the lower left corner. A clearer view of this component appears at the left of Figure 5. In this Figure, part of the clockwork mechanism is visible in the lower right center of the device.

**COMMENT**

This complex device was fabricated from simple, readily available items. Furthermore, although the entire assembly was complicated, each of the circuits was relatively simple and none of them required specialized knowledge of electronics. Such an IED, if fully armed and functional, would pose a serious threat to both passersby and anyone attempting to examine or disarm it.

Anyone discovering a device similar to the one described in this bulletin should advise the nearest FBI Field Office immediately.

# IMPROVISED BLASTING CAPS

**1. Classification: Restricted Technical Data.**

**2. Subject: Improvised Blasting Caps.**

**3. Source: Foreign.**

**4. Background:** Blasting caps are blasting accessories, usually metal, which contain a small amount of sensitive explosive material and are used to detonate larger charges. They may be actuated either pyrotechnically or with an electric current, and are frequently encountered in improvised explosive devices (IED). The construction of two improvised blasting caps has been reported to the FBI Bomb Data Program recently by foreign participants. One of the caps, made by a terrorist group, is nonelectric and was fabricated from plastic rather than metal components. The other, also recovered from a terrorist source, uses a flashbulb to ignite the contents and is activated electrically. Each improvised cap is described in this bulletin.

**5. Plastic Blasting Cap.**

A terrorist group was apparently responsible for the construction of a small, nonelectric initiator, to be used with commercial or improvised fuse. The device consists of a plastic tube containing a primer and an initiating charge, separated by seals. It is approximately 2 inches long and 3/8 inch in diameter and contains less than an ounce of explosive substances. The seals, one of which is situated between the charges, are 1/4 inch diameter cups. Each has a hole in the bottom. See Figure 1. The second seal was placed behind the initiating charge in the recovered device. A portion of the tube, approximately 1/3 of its length, is hollow. This recess is provided for the insertion of fuse. The other end, containing the primer, would be embedded in dynamite or another explosive.

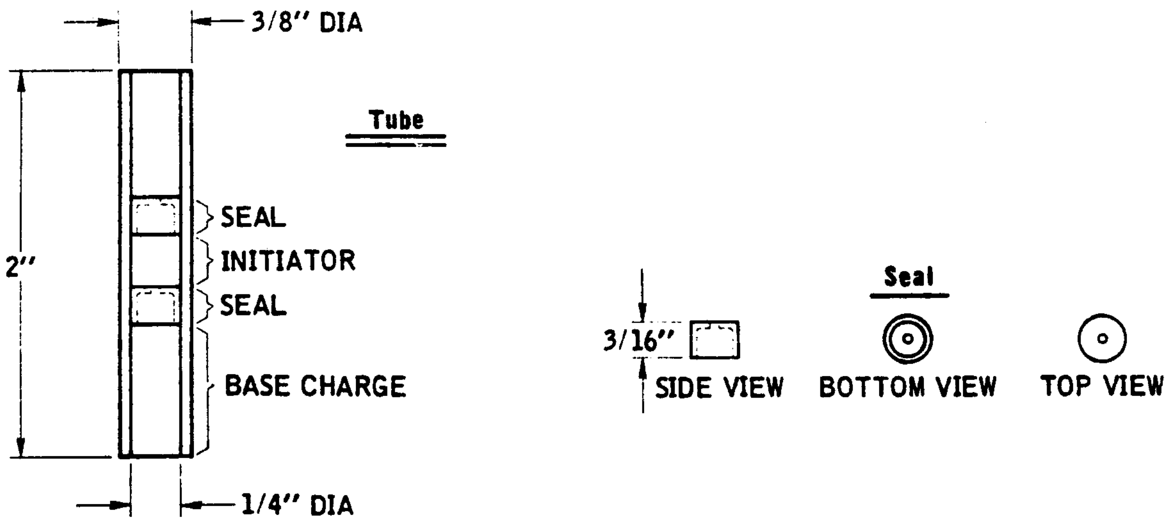


FIGURE 1: IMPROVISED NONELECTRIC BLASTING CAP WITH PLASTIC COMPONENTS

This device was probably intended to function in the same way as any other nonelectric blasting cap. Burning fuse ignites the sensitive initiating charge, causing the detonation of the primer and main explosive material.

Plastic is an unusual substance for construction of such an item. The fact that this detonator contains no metal makes it difficult to detect by x-ray or other metal detection procedures.

### 6. Improvised Electric Detonator.

Information concerning this device is being presented by the FBI BDP through the courtesy of the Canadian Bomb Data Centre (CBDC), Royal Canadian Mounted Police. The CBDC bulletin describing this improvised blasting cap is reprinted in this publication for the information of all FBI BDP special technician participants.

#### Introduction

In a recent seizure of terrorist material, two copper tubes were recovered which have been identified as improvised electric detonators. Fifteen days later, a derelict vehicle, containing an ambush bomb thought to be for command wire initiation, was moved unwittingly from the roadside to a rubbish dump by Council workers. Investigation of the device revealed that an improvised electric detonator, identical to the first, was connected to a short firing cable, and had taped to it two commercial detonators of a delay series, with their leg wires cut. The whole unit was inserted into the main charge of homemade explosive.

**Description** See Figure 2.

*Outer Container.* Thin-walled copper tubing 3 inches in length by 1/2 inch in diameter, sealed at both ends with a commercial bonding sealer.

*Main Charge.* Small quantity of brown homemade mercury fulminate.

*Initiator.* A photoflash bulb with a blue and a yellow wire protruding through the sealing plug at one end.

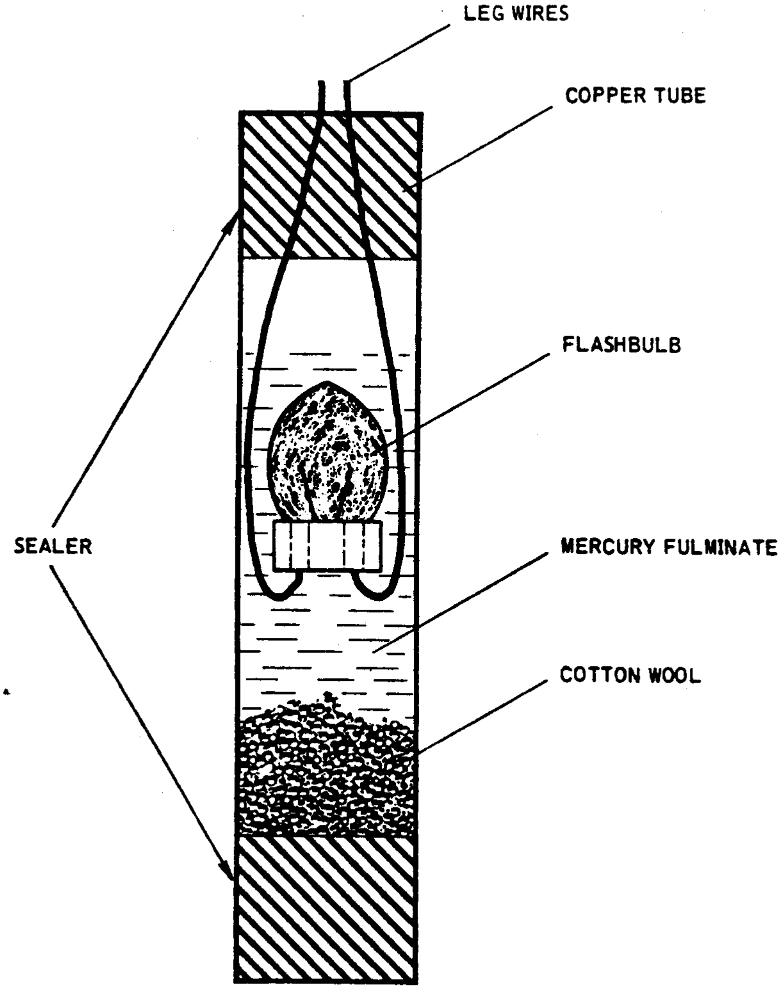


FIGURE 2: IMPROVISED ELECTRIC DETONATOR WITH FLASHBULB.

### Comment

One possible source of information for the preparation could be the instructions contained in a U. S. Army publication dealing with unconventional warfare. This details the method of producing 5 grams of mercury fulminate, and its use in a 3 inch long metal tube. Although the manufacture of improvised detonators is not common, it has been encountered in many parts of the world, but rarely with a homemade primary explosive.

### Firing Trials

These were carried out on improvised detonators manufactured to the same specifications but initiated by an electric fuzehead in place of the flashbulb. The result was a complete detonation of both commercial explosive and chlorate/nitrobenzine mix, but no initiation of an ANFO mix.

## COMMENT

Because a blasting cap of some kind is such a common necessity in the fabrication of IED, terrorists and other bomb builders are constantly improvising and producing new variants. Technicians should remain aware that such apparatus, which are frequently encountered when disassembling IED, are limited only by the imagination of the fabricator and the available resources. Both of the detonators described in this bulletin were constructed from ordinary materials and would seem to operate in a commonplace manner. Either one, however, could pose an unsuspected threat to an unwary technician.

# IMPROVISED EXPLOSIVE DEVICES

## INSTRUCTIONS FOR MAKING IMPROVISED EXPLOSIVE DEVICES (IED) – ISSUED BY A DOMESTIC REVOLUTIONARY/TERRORIST SOURCE

**Source: Domestic.**

The FBI Bomb Data and Terrorist Research Centers (BDC-TRC) recently received copies of two documents compiled by revolutionaries in the western United States. The items are: a Peoples Information Relay (PIR) newsletter for April, 1: , and several pages from The Urban Guerrilla (TUG) #2, published in the spring of and disseminated with the PIR newsletter. The articles concern booby-trapping by revolutionary groups as well as containing explicit instructions for the construction of various improvised explosive devices (IED). The relevant portion of the PIR newsletter is exactly quoted in this FBI BDC Special Technicians Bulletin; the TUG excerpt has been reproduced, and is included at the end of the narrative.

The dissemination of the data in these articles to domestic revolutionary organizations poses a present danger to bomb technicians and the entire law enforcement community. The PIR has been active in the past in promoting the activities and ideas of the New World Liberation Front (NWLF), a revolutionary organization responsible for over 71 bombings in the western United States. This information and similar data in other publications is available to any group or individual who may wish to use it.

### FOCUS: BOOBYTRAPPING (From PIR newsletter)

In March, police found a person blown-apart (sic) by a bomb in Denver. They claimed the remains, spread over a 2 block area, were once Carlos Zapata, an organizer in the Chicano community, and launched a wave of repression in the barrios: warrantless searches, arrests and Grand Jury subpoenas. Not surprizing (sic) since the target of the attack was apparently the Denver bomb squad.

There were three bombs altogether, placed in the vicinity of an isolated VFW hall: a dynamite bomb in the parking lot that exploded, a second dynamite bomb which also exploded, killing Carlos, and an anti-personnel device (a pipe-bomb full of nuts and bolts) which had been set to detonate one hour after the dynamite blasts. The third bomb was discovered and disarmed but had been placed so as to explode in the midst of the bomb squad who would be sifting through the debris from the earlier blasts.

On July 4th of last year the George Jackson Brigade raised the question of whether it was appropriate to boobytrap any or all of their bombs in a communique titled "Tell no Lies, Claim no Easy Victories" which is included in this mailing. The communique asked for feedback and several people have written PIR to comment on the subject. Every letter we received endorsed the tactic of boobytrapping although most expressed reservation and an analysis by the James Rector Collective is included in this mailing since it is fairly representative of the comments we've received. *FBI BDC Editor's Note: Neither the George Jackson Brigade (GJB) communique nor the James Rector Collective analysis is presented in this publication.*

Perhaps more to the point are these observations by a revolutionary film director: "Police are paid more than miners for safer work. Directors of Security in the industrial empire, they have become like the Roman Legions: a new class within the class system. They are more loyal to the present oppressive class system than those who actually own it."

Underground groups have taken an ambivalent stance on boobytrapping bombs. To our knowledge, no domestic guerrilla unit has actually done any boobytrapping prior to the Denver attack but GJB has threatened to and the NWLF published boobytrap instructions as long ago as July, PIR reprinted those instructions a year later in TUG #2 and that section of TUG - complete with diagrams - is included in this mailing.

**PIR takes the position that while there are unquestionably many cops and watchpersons who are decent people, trying only to make a living, there are also a great many who are pigs. According to our sources, the Denver bomb squad are pigs and we support the attempt to attack them, mourning the loss of a comrade. We support the tactic of booby trapping if every precaution is taken to protect the lives of the relatively innocent.**

**The TUG #2 excerpt, "Manual of Warfare", contains two parts: Detonations and Arson. The first describes construction principles and possible uses for a mousetrap switch and a clockwork delay mechanism. The second section provides recipes for several varieties of homemade incendiary compounds as well as instructions for their ignition.**

## COMMENT

The PIR is incorrect in stating that the Denver incident is unprecedented in the use of a booby-trapped bomb. The practice is not common among domestic revolutionary groups, probably because it is a poor method of eliciting public sympathy; but it is not unknown. On December 11, , for example, a fake report to the New York City Police Department led to an investigation in a Manhattan tenement. As an apartment door was opened by the responding personnel, an explosion occurred. The IED used in this instance had apparently been equipped with a clothespin and insulating wedge mechanism, and was situated to detonate when the door was opened. Within hours of the blast, a communique from Fuerzas Armadas de Liberacion Nacional Puertorriquena (FALN) was issued, claiming responsibility for the attack. During late a group calling itself the Comandos Revolucionarios Independistas Armados (CRIA) was responsible for the mailing of several letterbombs. Three of these, arriving in New York post offices on November 24, , were found to contain a booby trap mechanism. Each was to be activated by pressure applied to the envelope; the switches were so situated within the envelopes that a mere grasp of the hand could have caused ignition.

# Manual of Warfare

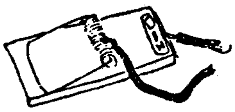
## PART I DETONATIONS

### MOUSETRAP SWITCH

A common mousetrap can be used to make a circuit switch for electrically initiated explosives, mines, and booby traps.

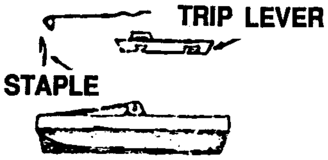
### MATERIAL REQUIRED

Mousetrap
Hacksaw or file
Connecting wires



### PROCEDURE

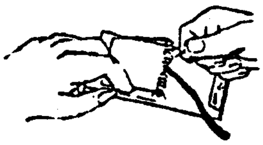
1. Remove the trip lever from the mousetrap using a hacksaw or file. Also remove the staple and holding wire.



2. Retract the striker of the mousetrap and attach the trip lever across the end of the wood base using the staple with which the holding wire is attached. If the trip lever is not made of metal, a piece of metal of approximately the same size should be used.

3. Strip one inch (21/2 cm) of insulation from the ends of two connecting wires.

4. Wrap one wire tightly around the spring loaded striker of the mousetrap.

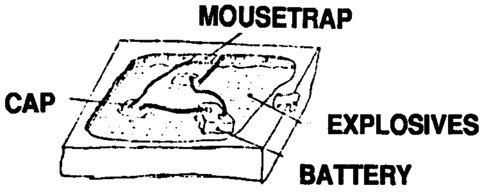


5. Wrap the second wire around some part of the trip lever or piece of metal. If a soldering iron is available, solder both of the above wires in place

### USES

The switch can be used in a number of ways, one typical method is presented here.

The switch is placed inside a box which also contains the explosives and batteries. The spring loaded striker is held back by the lid of the box and when the box is opened the circuit is closed.



# WATCH DELAY TIMER

A time delay device for use with electrical firing circuit can be made by using a watch with a plastic crystal.

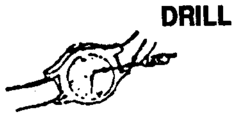
## MATFRIAL REQUIRED

Watch with plastic crystal
Small clean metal screw
Battery
Connecting wires
Drill or nail

## PROCEDURE

1. If watch has a sweep or large second hand, remove it. If delay time of more than one hour is required, also remove the minute hand. If hands are painted, carefully scrape paint from contact edge with knife.

2. Drill a hole through the crystal of the watch or pierce the crystal with a heated nail. The hole must be small enough that the screw can be tightly threaded into it.



3. Place the screw in the hole and turn down as far as possible without making contact with the face of the watch. If screw has a pointed tip, it may be necessary to grind the tip flat. If no screw is available, pass a bent stiff wire through the hole and tape to the crystal. IMPORTANT: Check to make sure hand of watch cannot pass screw or wire without contacting it.

## HOW TO USE

1. Set the watch so that a hand will touch the screw or wire at the time you want the firing circuit completed.

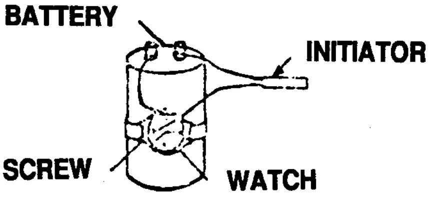
2. Wind the watch

3. Attach a wire from the case of the watch to one terminal of the battery.

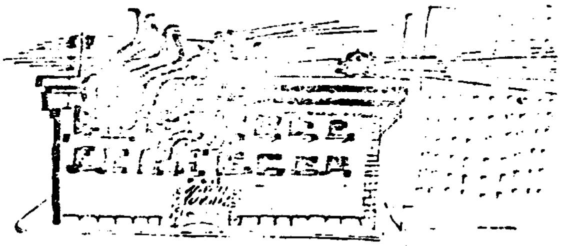
4. Attach one wire from an electric initiator (blasting cap, squib or alarm device) to the screw or wire on the face of the watch.

5. After thorough inspection is made to assure that the screw or wire connected to it is not touching the face or case of the watch, attach the other wire from the initiator to the second terminal of the battery.

CAUTION: Follow this step carefully to prevent premature initiation.



# PART II ARSON



Common household soap can be used in combination with alcohol to gel gasoline for use as a flame fuel. which will adhere to target surfaces.

When making kitchen napalm, be sure that there are no open flames in the room. This includes pilot lights on stoves, heaters, and hot-water heaters. NO SMOKING!

Start with soap, 20 parts by volume if powdered, 28 parts if flakes. Make sure that the package says "soap". Many washing compounds are detergents, and cannot be used.

Mix 36 parts of gasoline with 1 part of whiskey, wood, or rubbing alcohol and add the soap, stirring occassionally until thickened (15 minutes).

## FUSE

For a fuse, use an M-80 firecracker. Place it snugly in the top of the container.

For detonation, impale a non-filter cigarette on the fuse of the M-80. When it burns down (10 minutes) and ignites the fuse of the firecracker, the glass container will be shattered and the gasoline will be ignited and will cover and adhere to all nearby surfaces.

Experiment with the firecracker and cigarette before using this method of arson. The fire will spread very quickly and great care should be taken to assure that buildings slated for attack be completely unoccupied.

## PIR REPORT

This information was taken from a communique issued by Kitchen Table Press. It began with a Brecht quote:

What kind of an age is it
when to speak of trees
is almost a crime
because of the crimes
it leaves unsaid?

# IMPROVISED EXPLOSIVE DEVICE USED IN CASINO EXTORTION ATTEMPT

**IMPROVISED EXPLOSIVE DEVICE USED IN CASINO EXTORTION ATTEMPT**
**SOURCE: Domestic**

An extortion attempt against a Stateline, Nevada hotel/casino culminated in the explosion of an improvised explosive device (IED) on August 28, Although property damage was extensive, there were no injuries. The heavily trafficked establishment had been evacuated before the detonation. Purported to be office equipment, the large (over 1,000 pounds) IED had been situated within the building hours before. During this period it was photographed and X-rayed. These pictures, plus the results of post-blast debris examination, permit the description of the IED disseminated in this publication.

The bomb was contained in two fabricated metal boxes, of professional quality construction. The same materials appear to have been used for each box. The inclusive IED was sprayed with several layers of gray paint.

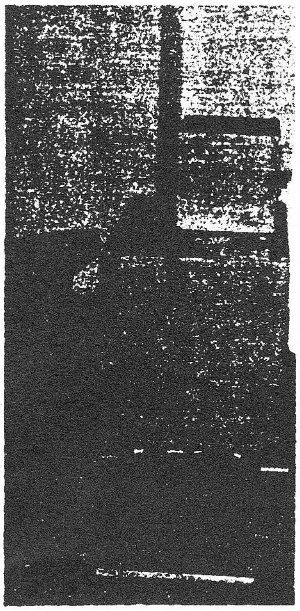


FIGURE: IMPROVISED EXPLOSIVE DEVICE

A major component of the largest box was the main explosive charge. It appears also to have contained booster materials, some electrical components, and an electric blasting cap used to detonate the IED. A total of 34 switches were affixed to opposite sides of the smaller box. Within this receptacle was contained the highly sophisticated electrical fuzing system which, in conjunction with the switches, would permit detonation by several means. The power source for the IED was probably contained in this box.

Outer Containers - Both boxes were constructed from a ferrous (iron) metal approximately 3/16 inch thick. Their seams appear to have been a combination of welding and body putty.

The large box on the bottom measured 24 inches by 26 inches by 45 inches. Its lid was affixed with countersunk screws and entirely sealed with body putty. Welded to the bottom of this container were four large 360 degree rotation wheels set inside of four smaller steel wheels. Also affixed to the underside was a metal handle capable of moving up and down on a pin hinge. This handle could have been removed by detaching the pin.

The smaller box, which was affixed off-center to the top of the larger one, measured 14 inches by 14 3/8 inches by 22½ inches. Its top was secured with 12 flathead screws. A weld-secured hex nut was placed in the center of this lid. It was apparently used during assembly of the IED. There was a small opening in the base of this box, from which a length of plastic tape protruded. It was attached to something within the box and when touched by probe, it had a spring-like action.

The impressions of five additional lengths of tape were noted on the surface of the lid of the larger box. Adhering to this same area were fragments of masking tape, which appeared to be placed over the other five pieces of removed tape. The top box was fastened to the bottom one with a weld or bonding putty. The smooth seam which was apparent indicated that welding could only have been done from the inside. Prior to the detonation of the IED, some of the bonding material appeared to be breaking away from the sealed screws and edges.

Attempts were made to stabilize the device: on each bottom corner of the larger box was a screw-type leveling nut; at each top corner, a leveling bubble. Plywood blocks were placed under the leveling nuts. While the IED was in situ, each of the four leveling bubbles was off-center, indicating that one side was higher than the other.

Main Explosive Charge - X-rays revealed that the main explosive substance filled the large box to within six inches of its top, and was secured in place by a protective cover. Embedded within this material appeared to be several cylindrical objects, such as dynamite or water gel cartridges, which could have served as a booster. A blasting cap was inserted among these cartridges. After observing the damage from the detonation, it was determined that the explosive charge weighed approximately 700 pounds and was equivalent in strength to TNT.

Electrical Fuzing System - The fuzing system of the IED was powered by what appear to have been two wet cell batteries, such as are used in motorcycles.

Twenty-eight toggle switches, numbered 1 through 28, were affixed to one side of the small container; three rows of six switches alternating with two rows of five. On the opposite side of the box were six brass-like pole or twist-type switches numbered 21 through 26. The screws used to secure the lid were numbered 1 through 12 counter-clockwise around the lid. The X-rays revealed a wire terminating at each switch and the end of each screw.

Among the components of the larger box were several switching apparatus. One resembled a single pole, single throw, normally open switch, possibly serving as an anti-opening switch. Two, mechanisms that could have been time delay switches. During the examination of the IED, an intermittent sound could be heard, perhaps emanating from one of these apparatus.

# IMPROVISED GAS OR EXPLOSIVE DEVICE

Information concerning the recovery of an unusual improvised explosive device (IED) was recently received from the West German Federal Criminal Police (BKA), Criminal Devices Information Service. The IED contained hydrochloric acid and iron filings and was to be actuated through a complex electronic circuit. A description is now available to FBI Bomb Data Center (BDC) special technician participants.

## BACKGROUND

A small package, wrapped in crepe paper, was discovered lying under a radiator in a Heidelberg, West Germany, restaurant. Two batteries, an electric circuit, a switch, and a heating coil were revealed in an X-ray taken of the item. After its removal to a demolition disposal site, the the suspicious object was defused and disassembled.

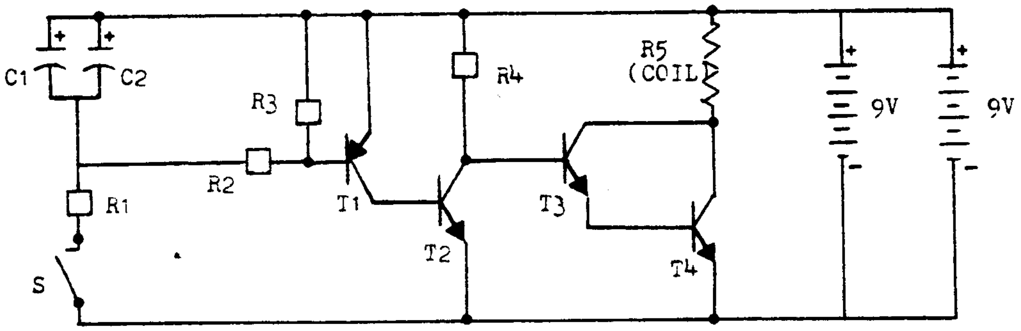
## DESCRIPTION OF DEVICE

The IED was enclosed in a Dunhill International cigarette package, measuring approximately 3 3/4 inches by 3 1/2 inches by 7/8 inch, and wrapped in the crepe paper. The package, which showed random puncture marks, contained both the filler and the ignition device. The explosive content of the IED consisted of a sealed plastic bag of hydrochloric acid surrounded by a small quantity of iron filings. The ignition device was constructed from:

- Two 9 volt batteries;
- A push button switch (multiple on-off switch);
- An improvised switching circuit; and
- A heating coil, controlled by a series of transistors and condensers, used as an ignition delay device.

The coil was inserted into the bag of acid.

## OPERATING SYSTEM OF THE IGNITION DEVICE



SCHEMATIC DIAGRAM OF IGNITION SYSTEM

The two 9 volt batteries, which were connected in parallel, provide power for the system. When closed, the switch (S on the schematic diagram) completes a circuit in which T1 and T2 are switched through, and T3 and T4 are disconnected. This does not permit current through R5, the heating coil. The ignition device, therefore, is unarmed until the switch is opened. At this time, the electric circuit incorporating R5 is completed by the following means. Capacitors C1 and C2 release their charge via the voltage dividers R2, R3, and the base current of T1. Once C1 and C2 are discharged, T1 and T2 are blocked via R3. Simultaneously, the base of T3 becomes positive via R4 and the T3 and T4 transistors, which are wired in a Darlington circuit (compound connected transistors) are fully driven.

The switching circuit acts as an ignition device with a delay time of approximately one hour after arming. When the IED was recovered, the switch was in the "on" position and it was, therefore, unarmed.

### OPERATION OF THE OVERALL SYSTEM

The heating coil was presumably intended to produce hydrochloric acid vapors. It is also possible that the fabricator of the IED had intended to produce a chemical reaction between the hydrochloric acid and the iron filings in order to create hydrogen when the acid was released. The hydrogen could then have been ignited by the heating coil. There would have been an immediate voltage drop to 3 to 4 volts when T3 and T4 were switched on. This would occur because of the poor cathode current characteristics of the transistors, and the low capacity (2 x 0.24 ampere hours) and unfavorable internal resistance of the batteries. With the resulting low current, the heating coil would have shown only a slight increase in temperature. Under load, the voltage would have continued to decrease steadily.

### SPECIAL NOTE

Tests on this device, conducted by the Office of Criminal Investigation in Stuttgart, Germany, indicate that ignition by means of the electric circuit would have been highly probable if an expert had attempted to freeze the device with liquid nitrogen.

### COMMENT

The report on this device indicates two obvious hazards to a technician examining such an IED or attempting its disassembly. Crepe paper is extremely flammable and could have ignited from a minimal amount of heat in the coil. It combusts, furthermore, almost instantaneously and burns with an intense flame. Serious burns could result. In many cases, cryogenics provide a viable avenue for deactivating IED. As was noted, however, freezing this complex electronic system might have caused a detonation. Although the originating agency did not cite any reasons for this possibility, it may be hypothesized that freezing would be unsafe due to the following circumstance. The ultimate initiation of this IED would be dependent on both the interruption and completion of various electrical circuits. Freezing the components could cause a crucial interruption of current and allow actuation of the detonating circuit.

# IMPROVISED INSPECTION LAMPS

### IMPROVISED INSPECTION LAMPS

**Source: Bomb Squad, Baltimore County Police Department, Towson, Maryland.**

Having noted on several occasions while working with improvised explosive devices (IED) that the operation might have been facilitated with a small probe-type inspection lamp, an FBI Bomb Data Center (BDC) special technician participant has developed several such apparatus. Construction details for these small lamps, all of which are suitable for use in narrow, inaccessible areas, are provided in this bulletin. Each of the devices can be locally fabricated from readily available materials and will probably not cost over $5.00. An item of this kind can be a great boon to the technician, as the cost of a commercially manufactured lamp such as a physician's light could be prohibitive for many law enforcement agencies.

### Inspection Lamp Using Phone Jacks

One of the Baltimore inspection lamps for IED was constructed from a standard 6 volt plastic encased lantern modified by the addition of a flexible lighting device. Components of this modification are: a set of male and female mini-phone jacks, a 6 volt grain of wheat lamp, a piece of heat shrink tubing, and a length of double strand wire (such as leg wires). These items are depicted in Figure 1. Although the inspection lamp is not designed to operate in connection with the hand lantern, the internal components of this light are used to power the inspection device.

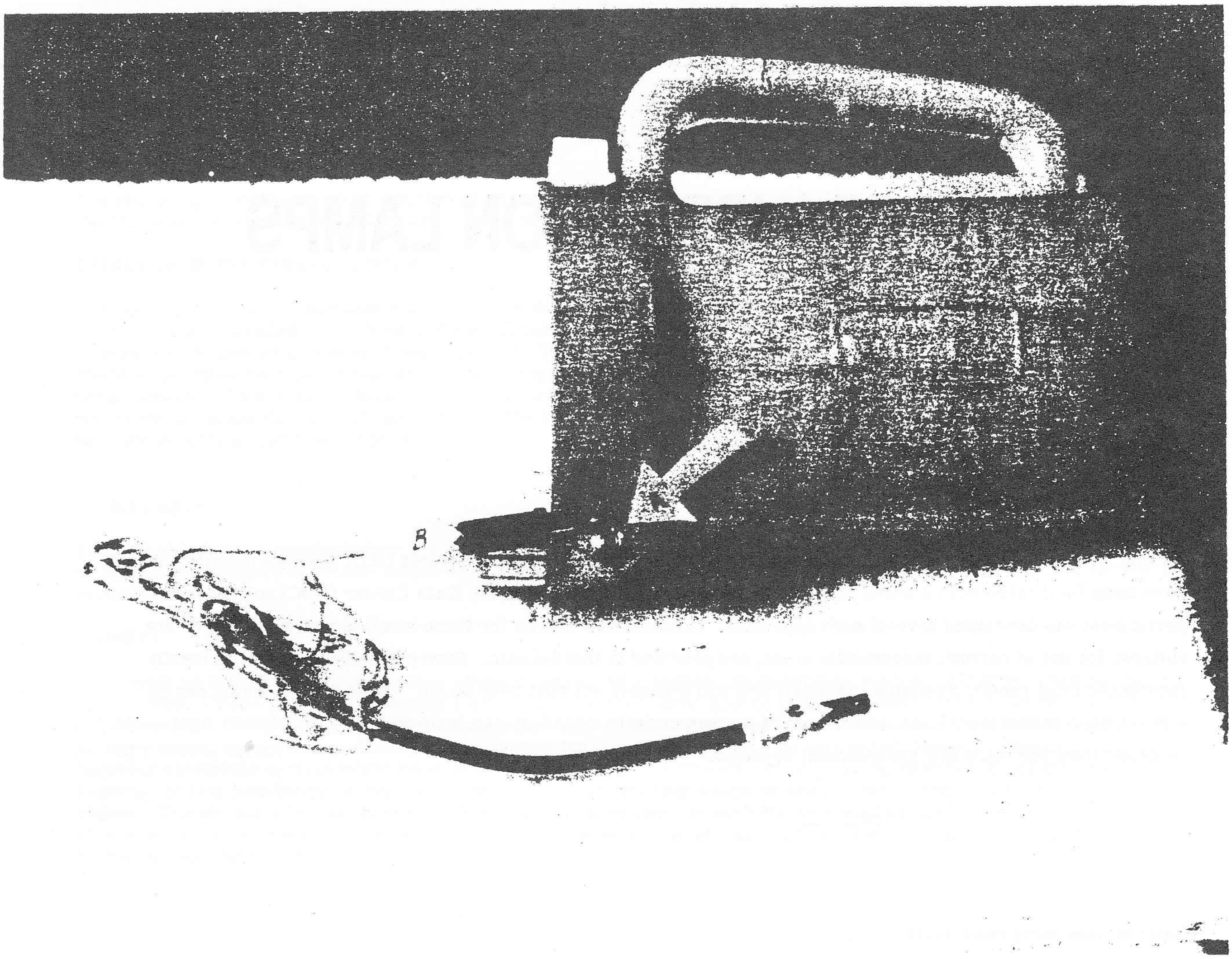


**FIGURE 1: PHONE JACK INSPECTION LAMP (A- Female Phone Jack Component; B- Male Component; C- Grain of Wheat Lamp)**

To fabricate the improvised lamp, the female mini-phone jack (Figure 1, A) is wired internally to the lantern circuitry: one leg wire to the base connector of its bulb; the other, to the ground side. This was done on the prototype in order that the jack could be plugged in at any time. The male portion of the phone jack apparatus (Figure 1, B) is affixed to the length of double strand wire. At the other end of this wire, the grain of wheat lamp is attached (Figure 1, C); it is protected by the piece of tubing from any type of accidental electrical contact or grounding out. When the male phone jack is plugged into the other portion, a lamp with a flexible working distance equal to the length of wire is provided. This item can be used in any aperture larger than the 3/16 inch diameter of the grain of wheat lamp.

The length of wire can be varied to suit the convenience of the technician or to meet the requirements of its prospective use. The fabricator of the prototype device experimented with various lengths ranging from 2 inches to 10 feet; he determined that a length of 6 feet was the most useful for his own operations. It should be remembered that as the length of the wire increases, the greater resistance will result in a dimmer light.

### Improvised Inspection Lamp with Fiber Optic Attachment

Another tool, which can provide two types of illumination, was also developed by the Baltimore County Bomb Squad staff. This apparatus is similar in some ways to the phone jack device, although it is more compact and expensive to construct. It utilizes a 2 cell AA pen light with two accessories: a fiber optic length (a flexible fiber which will incandesce throughout its length - usually used for decorative table lamps); and a grain of wheat light attached to a wire, similar to the item used in the phone jack inspection lamp. See Figure 2. Both of the attachments for this prototype were 18 inches long.

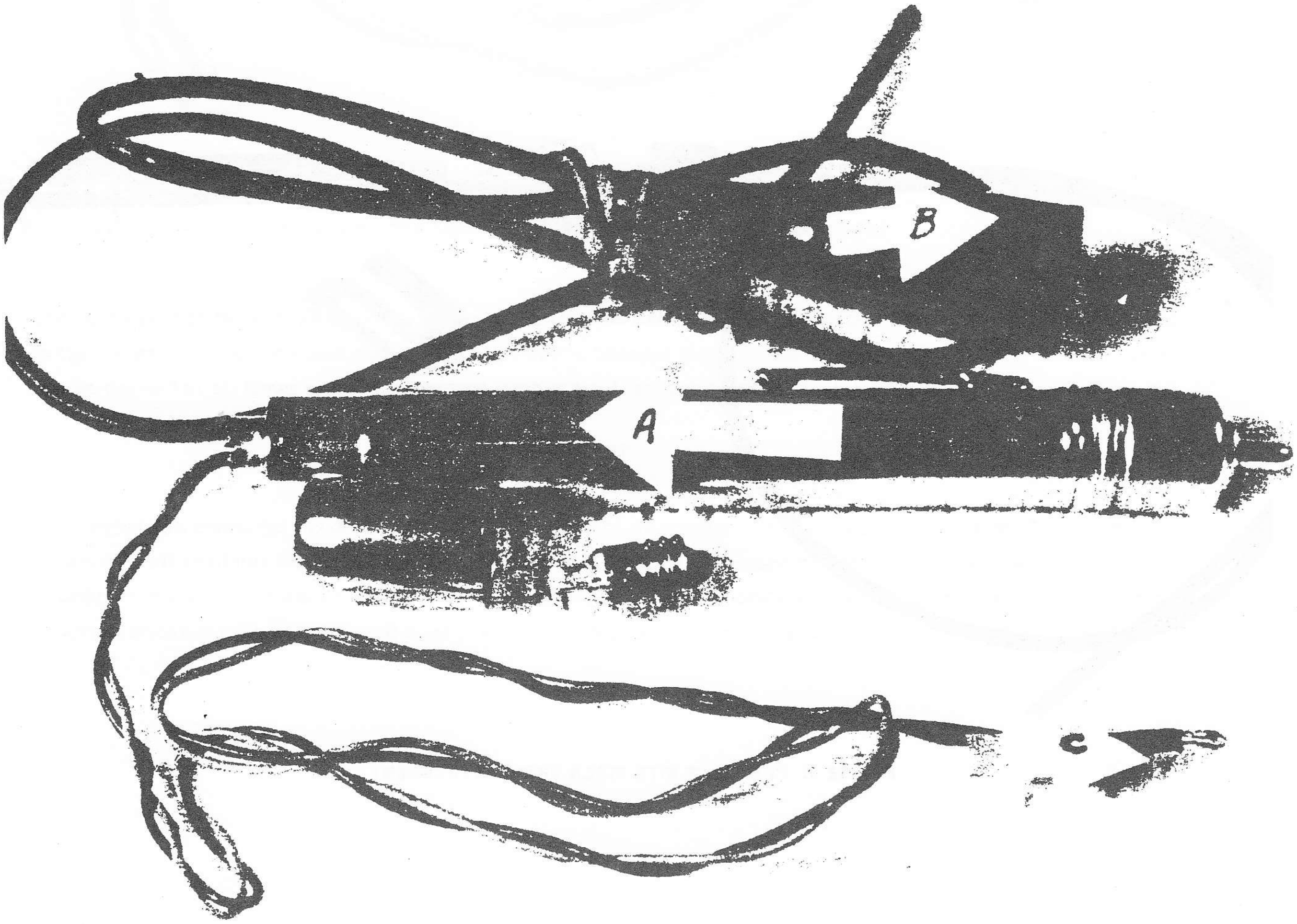


FIGURE 2: MODIFIED PEN LIGHT APPARATUS (A- Pen Light; B- Fiber Optic; C- Improvised Grain of Wheat Lamp)

Either the fiber optic or the grain of wheat lamp apparatus can be attached to tne pen light. (NOTE: The protective shield on the pen light can be utilized or removed as needed.) The fiber optic can be used to probe any surface where explosive residue is found or where a nonexplosive lamp is needed. See Figure 3. Figure 4 shows the other inspection device attached to the pen light body. This lamp can be used for internal examinations in any area larger than 1/8 inch. A grain of wheat light for this accessory can be improvised from the bulb of the pen light. The glass is removed, and one portion of the double-strand lead wire is soldered to the center of its base. The second wire is soldered to the side of the base, and the interior filled with an epoxy. This will keep out dirt and dust, as well as preventing the soldered connections from pulling apart.

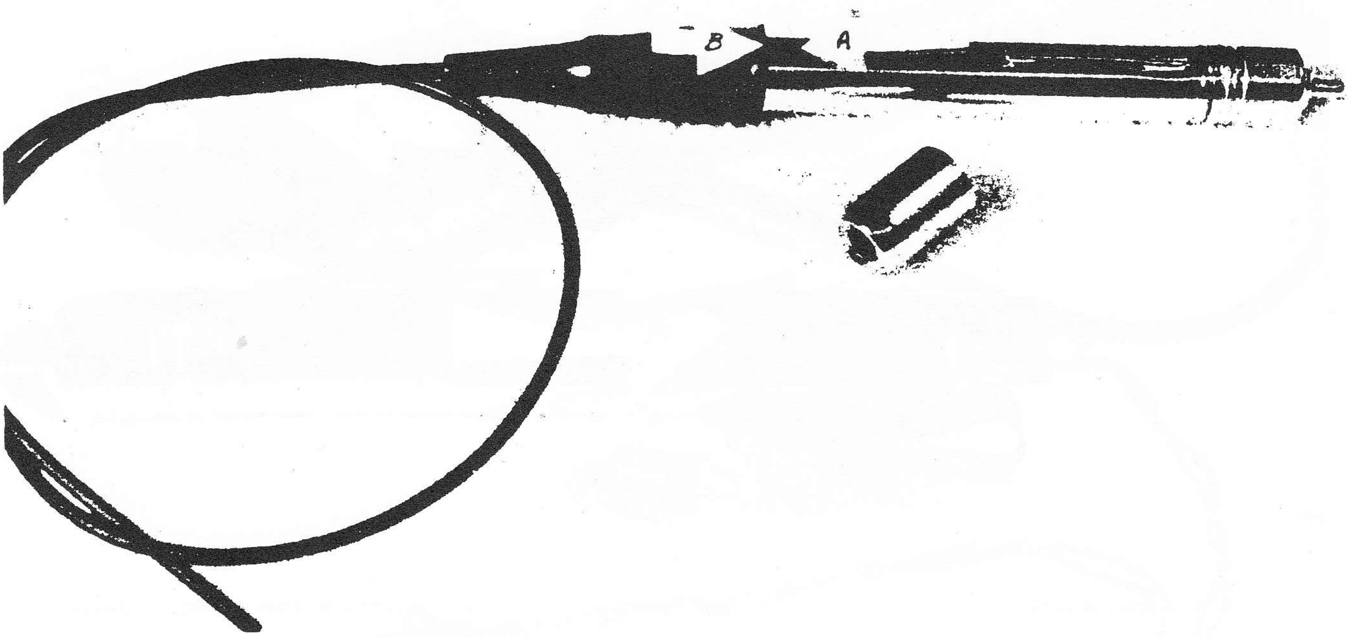


FIGURE 3: PEN LIGHT WITH FIBER OPTIC ATTACHMENT

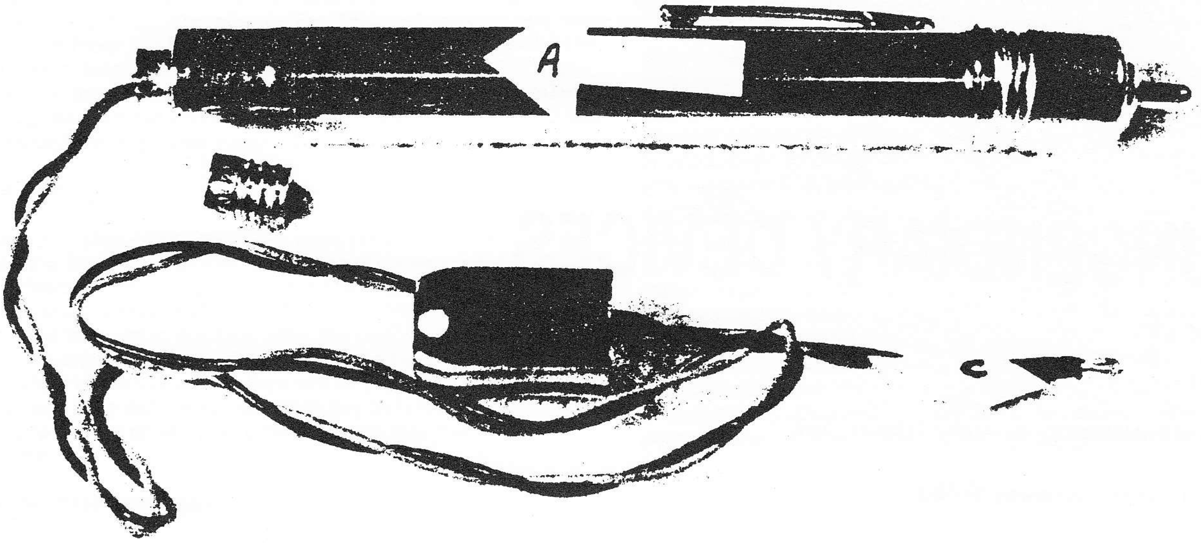


FIGURE 4: PEN LIGHT WITH GRAIN OF WHEAT LAMP APPARATUS

The fabricator of these devices notes: "Due to the flexible nature of these individual probes, they are very useful in tight areas. The three items shown are very flexible because they are not of specialized design. The pen light can be carried at all times and the inspection lamp is small enough to fit in the jacket pocket."

## COMMENT

This technician concludes his description of this equipment by stating: "It is the expressed desire of this technician that all available information and technology that is being developed by other technicians be exchanged in order to make our job easier and safer." Other agencies or technicians are urged to submit descriptions of similar locally fabricated apparatus, as well as any modification or adaptions of the items presented in this publication.

# INCENDIARY DEVICES

**1. Classification: Restricted Technical Data.**

**2. Subject: Incendiary Devices.**

**3. Source: Canadian Bomb Data Centre (CBDC).**

**4. Background:** Through the courtesy of the Canadian Bomb Data Centre (CBDC), Royal Canadian Mounted Police, CBDC Technical Bulletin 10-76 is reprinted below. This bulletin describes two incendiary devices that were discovered intact. Both the devices and their components should be of interest to FBI Bomb Data Program Special Technicians Bulletin recipients. (Figures 2, 3, 4 and 5 were provided by the CBDC for this bulletin, and were not included in their original publication.)

## TECHNICAL INFORMATION

Two incendiary devices discovered in the basement of a small apartment building on separate dates, April 24 and 26, 1 are the subject of this bulletin. In each instance the device was discovered by the owner of a beauty salon which was located on the street floor level of the building. The devices were hidden beneath an old mattress in the basement in an area allocated to tenants for the storage of personal belongings.

The two devices are referred to as "A" and "B" in order of discovery date. Although "A" was discovered two days prior to "B", it was not reported to police by the owner of the beauty parlor until the 26 April. It is possible the second device was in the basement when the first was found, but this has not been confirmed.

A motive of personal vengance aimed at the beauty parlor owner has been identified.

Device "A" Components

Container: A 6 volt plastic cased "Custom" lantern manufactured by NICHOLL BROS. INC., Kansas City, Mo., U.S.A. (Figure 1). The lens of the lantern was broken. Two white insulated electrical wires (belonging to the lantern electrical circuit) with quick disconnect terminals attached, extended through a hole in the lens. See Figure 1.

Power Source: A 6 volt RAY-O-VAC dry cell battery, Model No. 941. When found, the battery was in its normal position within the lantern casing. It had an efficiency of 2 volts.

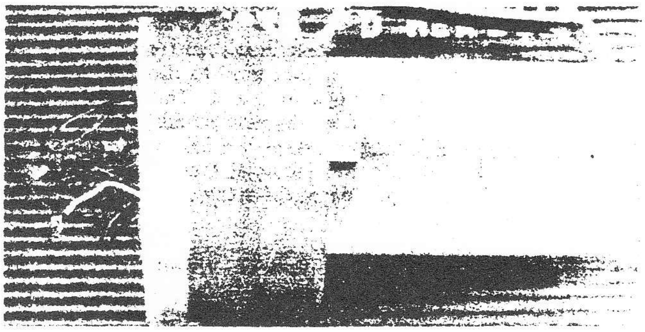


FIGURE 1

Incendiary Composition: Inside the lantern headlight cavity was an empty clear polyethylene bag which had previously contained a quantity of volatile liquid. The liquid fuel had evaporated. Subsequent laboratory analysis indicated a mixture of rubbing alcohol with 20 - 25 percent water content had been used.

Initiator: An AG-1B flash bulb manufactured by Canadian General Electric. The plastic Shatterproof coating had been removed from the bulb. Attached to, and coiled around the bulb were two 30 foot lengths of telephone wire with blue and grey insulation coverings. The bulb and loosely coiled wiring were found inside the headlight cavity along with the polyethylene bag. See Figure 2.

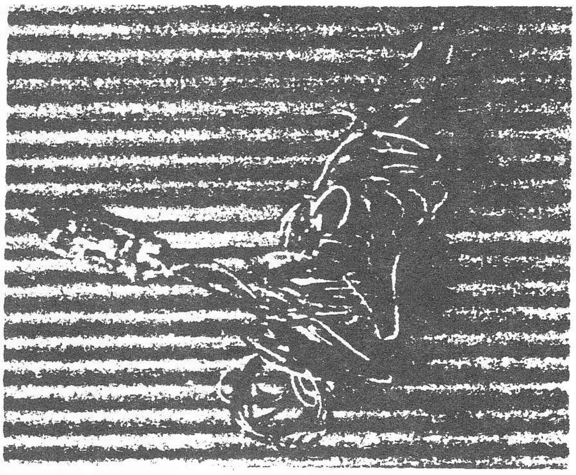


FIGURE 2

## Functioning

Since no delay component was incorporated it is assumed that the 30 foot length of telephone wire was intended as a "command" cable to initiate the incendiary composition from a relatively safe distance. With the flash bulb inserted into, or in contact with the fuel filled polyethylene bag, touching the bare wire ends to the terminals of a remotely placed power source would generally ensure ignition. It is not known whether the battery in the lantern casing or another power source was intended for use.

## Render Safe Procedure

Considering that the device had previously been handled and partially disassembled by the finder, the police technician separated remaining components in situ.

## Device "B"

Two plastic "Baggies" containing volatile fuel with a flash bulb initiator were the only similarities to Device "A". An electronic delay fuzing circuit similar to that described in F.B.I. Special Technicians Bulletin was incorporated for device initiation. No electronic delay fuzing circuit has previously been reported used in this country.

## Device Components

Incendiary Composition: As in device "A". (Rubbing alcohol containing 20 - 25 percent water).

Initiator: A Canadian General Electric flash bulb Model AG-1B, with the shatterproof plastic coating removed. Approximately 36 inches of dual conductor, white plastic insulated transistor earphone wire was connected to the flash bulb wire terminals at one end. The opposite end of this cable was connected to an earphone jack plug which was inserted into the jack receptacle of a small transistor radio containing the electronic delay. See Figure 3.

Electronic Component container: A "Selfix" transistor radio approximately 2 1/2 x 4 inches in width and length. The two piece moulded plastic casing was taped together with black vinyl tape. See Figure 4.

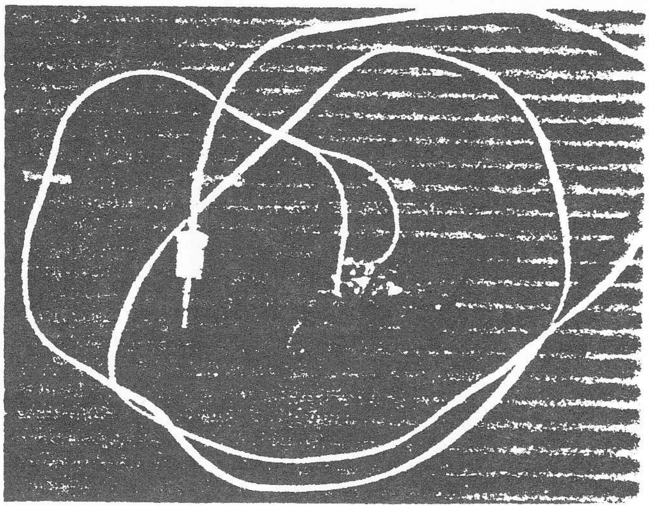


FIGURE 3

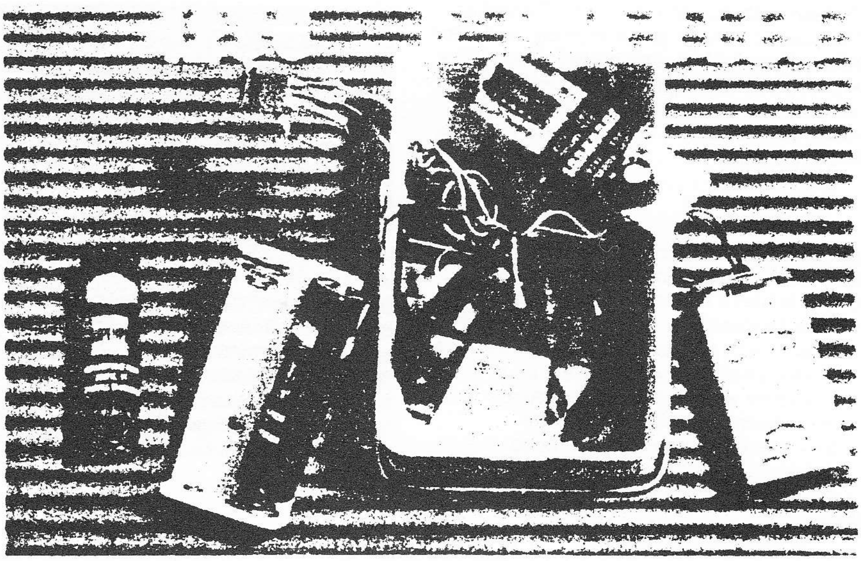


FIGURE 4

Power Sources:

Firing Circuit: 2, 1.5 volt Eveready (heavy duty) type AA batteries, Model No. 1215.

Delay Circuit: 1, 9 volt Eveready transistor battery, Model No. 216.

Electrical Wiring: Electrical wiring used in the device construction is the type used exclusively by the Bell Telephone Company of Canada (Bell Canada). (In Figure 5 Device "B" is assembled.)

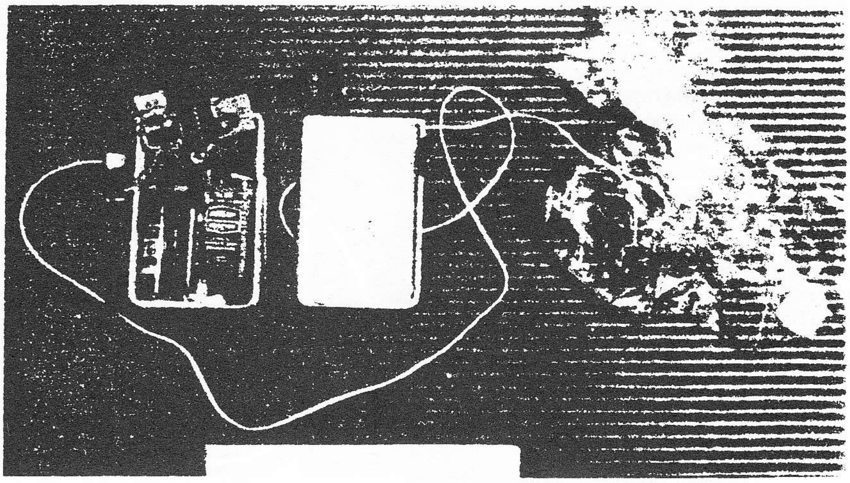


FIGURE 5

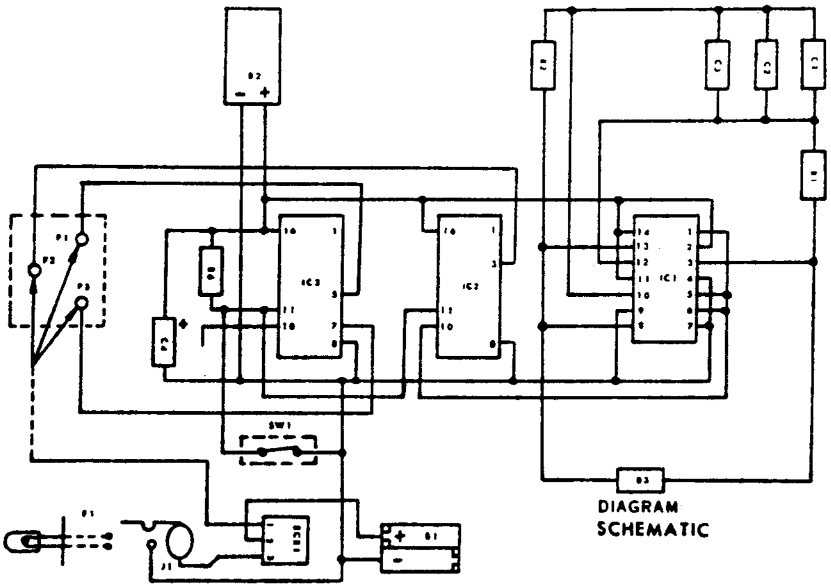


FIGURE 6

Electronic Components

| | |
|---|---|
| IC1 | Integrated Circuit - Timer (SSS 4007 AE) |
| IC2 | Integrated Circuit - Counter (SIL 4020 BE) |
| IC3 | Integrated Circuit - Counter (SIL 4020 BE) |
| SCR1 | Silicon Controlled Rectifier (Thyristor) (GEC 1 06 B1) |
| C1 | Electrolytic Capacitor .1 mfd. 50 volt DC |
| C2 | Electrolytic Capacitor .1 mfd. 50 volt DC |
| C3 | Electrolytic Capacitor .033 mfd. 50 volt DC |
| C4 | Electrolytic Capacitor 50 mfd. 10 volt DC |
| R1 | Resistor 470 K. ohm |
| R2 | Resistor 6.8 Meg. ohm |
| R3 | Resistor 1 Meg. ohm |
| R4 | Resistor 370 K. ohm |
| SW1 | Micro Switch (normally closed) |
| B1 | Power Source - Firing Circuit |
| B2 | Power Source - Delay Circuit |
| P1 | Delay Post |
| P2 | Delay Post |
| P3 | Delay Post |
| J1 | Phone Jack |
| F1 | Flash Bulb |
| IC1 | Identified as a "Dual complementary pair plus inverter" Model SSS 4007 AE manufactured by Solid State Scientific of Montgomeryville, PA. during the 49th week of 19 |
| IC2 | and IC3 Identified as "14 stage pair plus binary counter/divider" Model SIL 4020 BE manufactured by SILTECH of Bromont, P.Q. during the 20th week of |
| SW1 | A micro-switch was incorporated to avoid transient spike from enabling the device. (To eliminate the possibility of accidentally triggering the device.) |

## Functioning

The circuitry of this device constitutes an electronic timer which supplies power to an igniter (flash bulb) after a predetermined time period has elapsed. No moving or mechanical parts are involved. The total function of the device is accomplished electronically. There is no visual or audible indication that any timing process is taking place.

Timer (IC1) emits a pulse every 3.12499 seconds at contact #1. These pulses are repeated and forwarded to contact #10 (IC2) and counted. A constant number of $2^n$ pulses are counted by C2 which sends a 7 volt signal at a fixed time of $2^n$x3.125 seconds. (The value n for $2^n$ is the stage number of the binary counter selected to signal the firing circuit.)

The circuit uses 3 posts (P1, 2 and 3) for selection of time delays.

Post 1 provides a delay of 14.22 hours.
Post 2 provides a delay of 455.04 hours. (approximately 20 days) if pin #10 of IC3 is connected to pin #3 of IC2. This delay would be too long and impractical, hence pin #10 was left unconnected. Post 2 is at logic ground and would be a non-firing or safe position for storing or transporting the device.
Post 3 is again too long a delay for reliable use: Assuming pin #10 of IC3 to be connected to pin #3 of IC2, the following delays would be possible.

COUNTER IC2

| Contact # | | |
|---|---|---|
| 10 | 3.13 | seconds |
| 9 | 6.25 | " |
| 7 | 50. | " |
| 5 | 1.6 | minutes |
| 4 | 3.3 | " |
| 6 | 6.6 | " |
| 13 | 13.3 | " |
| 12 | 26.6 | " |
| 14 | 53.3 | " |
| 15 | 1.7 | hours |
| 1 | 3.55 | " |
| 2 | 7.11 | " |
| 3 | 14.22 | " |

COUNTER IC3

| Contact # | | |
|---|---|---|
| 10 | 14.22 | hours |
| 9 | 1.18 | days |
| 7 | 9.48 | " |
| 5 | 18.96 | " |
| 4 | 37.92 | " |
| *6 | 75.84 | " |
| *13 | 151.68 | " |
| *12 | 303.36 | " |
| *14 | 606.72 | " |
| *15 | 1213.44 | " |
| *1 | 2426.88 | " |
| *2 | 4853.76 | " |
| *3 | 9707.52 | " |

## COMMENT

M.U.C. technicians state that although this sophisticated device was apparently designed by a person with an advanced knowledge of integrated circuits, soldering methods and techniques and general construction was very uprofessional (sic).

Both devices were functional. In tests conducted by technicians it was determined that the incendiary composition could be readily ignited with the type flash bulb used - providing the shatterproof covering was removed, as it had been in both instances.

### Render Safe Procedure

In situ, the flashbulb was removed from the flammable liquid and physically separated from other device components. Components were then removed from the scene for investigation and laboratory analysis.

RENDER SAFE PROCEDURES DETAILED IN C.B.D.C. TECHNICAL BULLETINS ARE EXTRACTED FROM REPORTS RECEIVED. THE INFORMATION IS OFFERED AS GENERAL KNOWLEDGE ONLY AND IS NOT INTENDED AS A CONCLUSIVE PROCEDURE FOR ADOPTION IN LIKE CIRCUMSTANCES. DUE TO THE UNLIMITED POSSIBILITIES IN METHODS OF CONSTRUCTION GUARANTEED RSPs FOR IEDs CANNOT BE PREDEFINED.

*Battery to run logic circuit would have failed by this time.

# IRANIAN CONSULATE BOMBING LETTER BOMB EXTORTION PLOT

## BOMBING INCIDENT AT FOREIGN CONSULATE

**SOURCE:** Foreign

### Background

While making his rounds after 10:00 the night of April 26, the caretaker of the Iranian General Consulate located in Berlin-Dahlem, noticed two individuals leaving the consulate grounds. Continuing his rounds, the caretaker came upon a brown traveling case containing an unusual improvised explosive device (IED). See Figures 1 and 2. A bomb expert from police headquarters in Berlin was called and was able to deactivate the device approximately seven minutes before anticipated detonation.

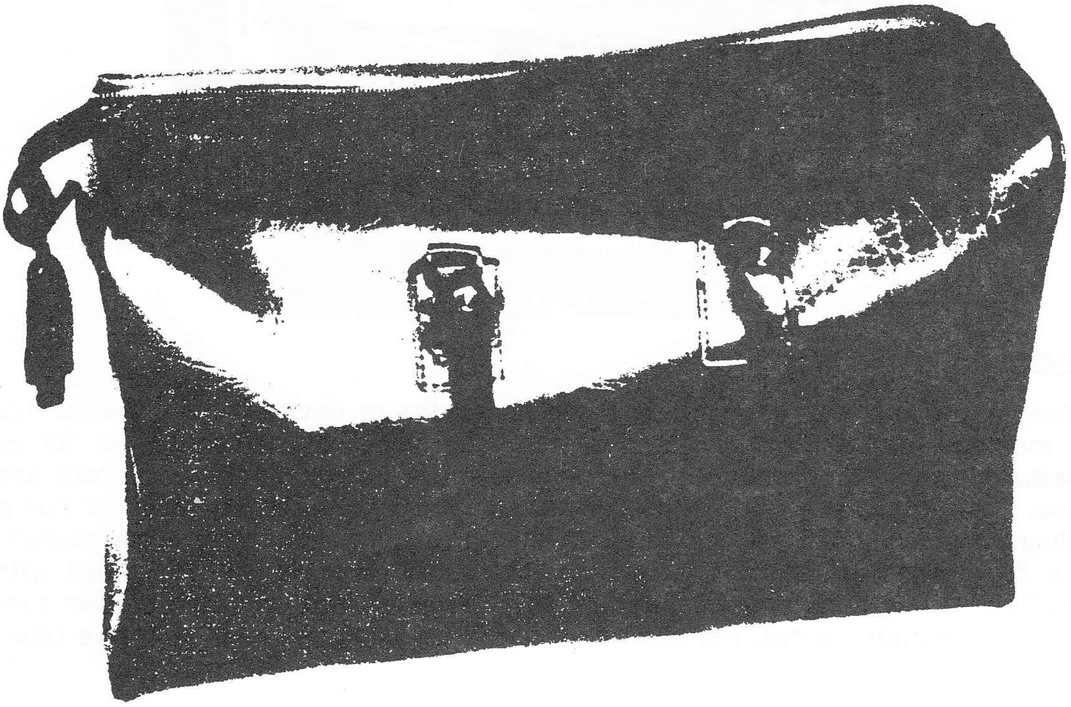


FIGURE 1: DARK BROWN TRAVEL BAG

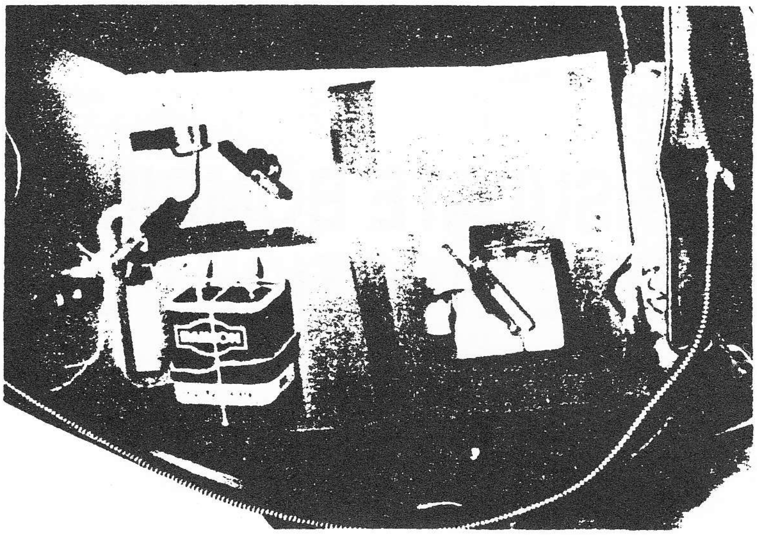


FIGURE 2: OPEN TRAVEL BAG WITH DEVICE

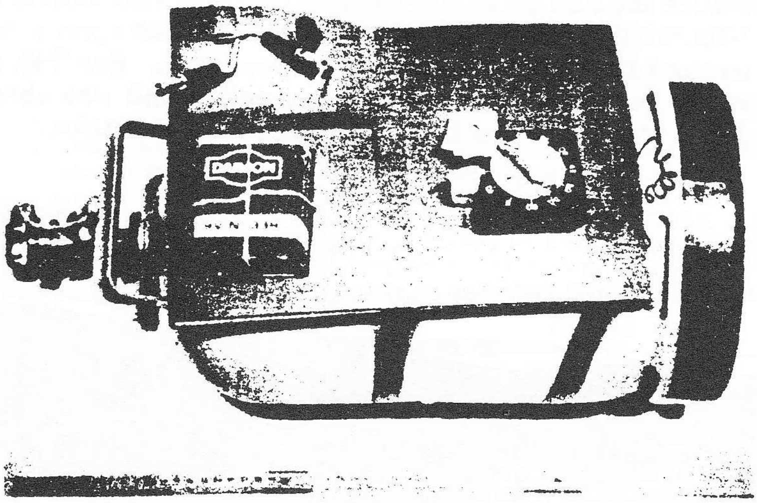


FIGURE 3: ENTIRE EXPLOSIVE DEVICE

**Components**

The disarmed bomb was determined to be an explosive device with a mechanical time delay mechanism. A steel canister of the type used to hold liquid gas for camping purposes, contained approximately 11 pounds of an impure sodium chlorate and sugar mixture. See Figure 4. The initiating mechanism consisted of several components including: a 9 volt transister battery, a timer, a magnetic holder from a magnetic door lock, a toggle switch and a flashbulb. Also used were two banana plugs with cross perforation, two banana plug connectors, match heads, two insulated copper wires, two insulated annunciator wires, red plastic adhesive tape and red linen adhesive tape.

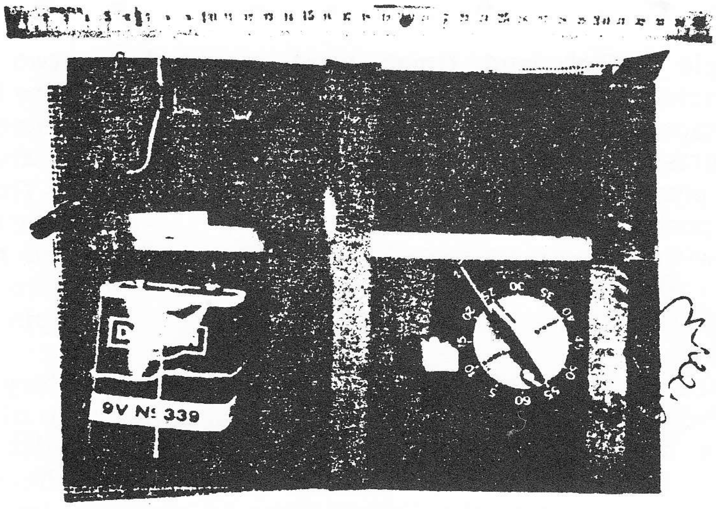


FIGURE 4: UPPER PART OF THE STEEL BOTTLE WITH SCREWED-ON VALVE AND INSERTED DETONATION WIRES

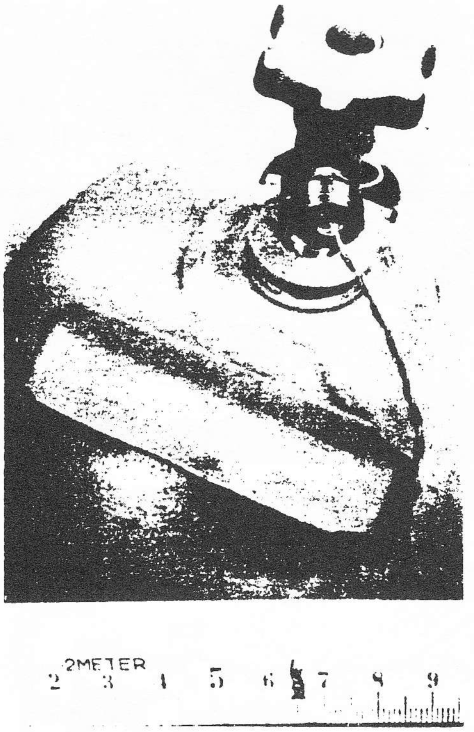


FIGURE 5: LINOLEUM PLATES WITH TIMER, TOGGLE SWITCH, WIRE CONNECTIONS, AND BANANA PLUGS

## Design

The battery, toggle switch and timer were mounted on two linoleum plates, approximately 12 inches by 8 inches. See Figure 5. The plates were held together with red linen adhesive tape and/or plastic adhesive tape. The wire connections ran between the plates. The battery was mounted on one of the plates with string and the toggle switch, which was provided for safety in transport. It was sunk flush into the plate. The "on" and "off" positions of the toggle switch were marked on the plate with "E" and "A". The timer, with a maximum running time of 60 minutes, was mounted with glue next to the battery. On one side of the timer, a magnetic holder from a magnetic door lock had been placed, and an iron nail was attached to the winding pin as a contact.

A blue insulated wire soldered onto the negative pole of the battery led to the toggle switch, and from there a red insulated wire led to the metal strip of the door magnet. After the set time had elapsed (a maximum of 45 minutes with the arrangement described above), the iron nail attached to the winding pin would have struck the metal strip. The nail was connected to the flashbulb inside the steel bottle via a plug and connected through to a red insulated wire. Likewise, a blue piece of wire was soldered to the positive pole of the battery, which led to the second pole of the flashbulb via a banana plug and connector. The scraped off match heads (primer charge) were housed in a paper wrapping and transparent adhesive tape, and shoved into the explosive, along with the flashbulb. See Figures 6, 7, and 8. The linoleum plates with the battery, timer and toggle switch were mounted on the steel bottle with 3/4 inch wide cloth adhesive tape.

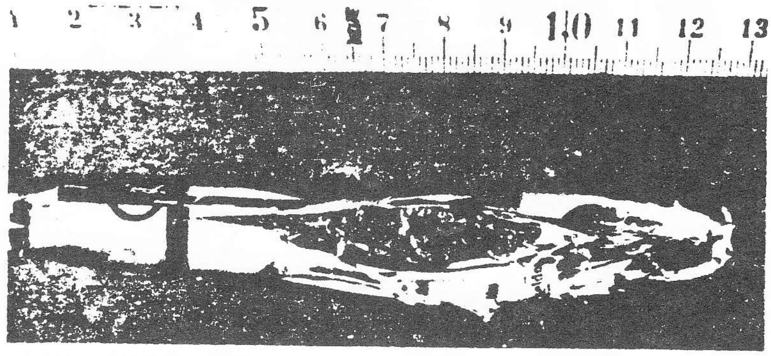


FIGURE 6: CUT-OPEN PAPER WRAPPING WITH SCRAPED OFF MATCH HEADS

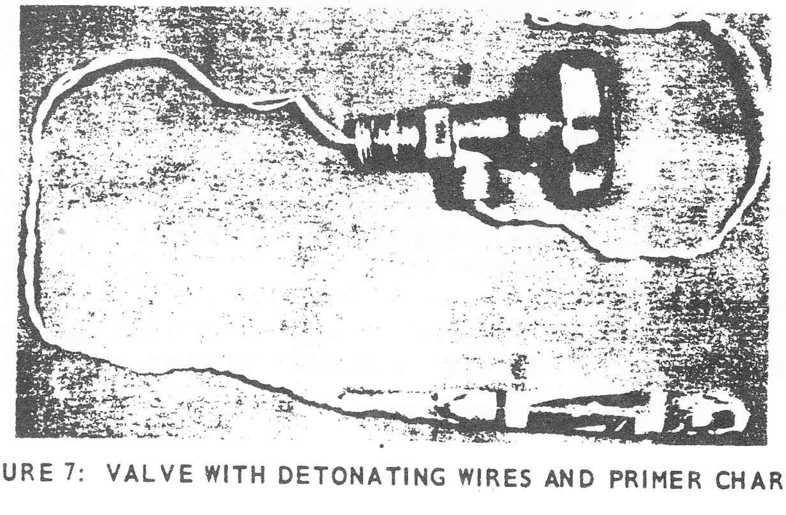


FIGURE 7: VALVE WITH DETONATING WIRES AND PRIMER CHARGE

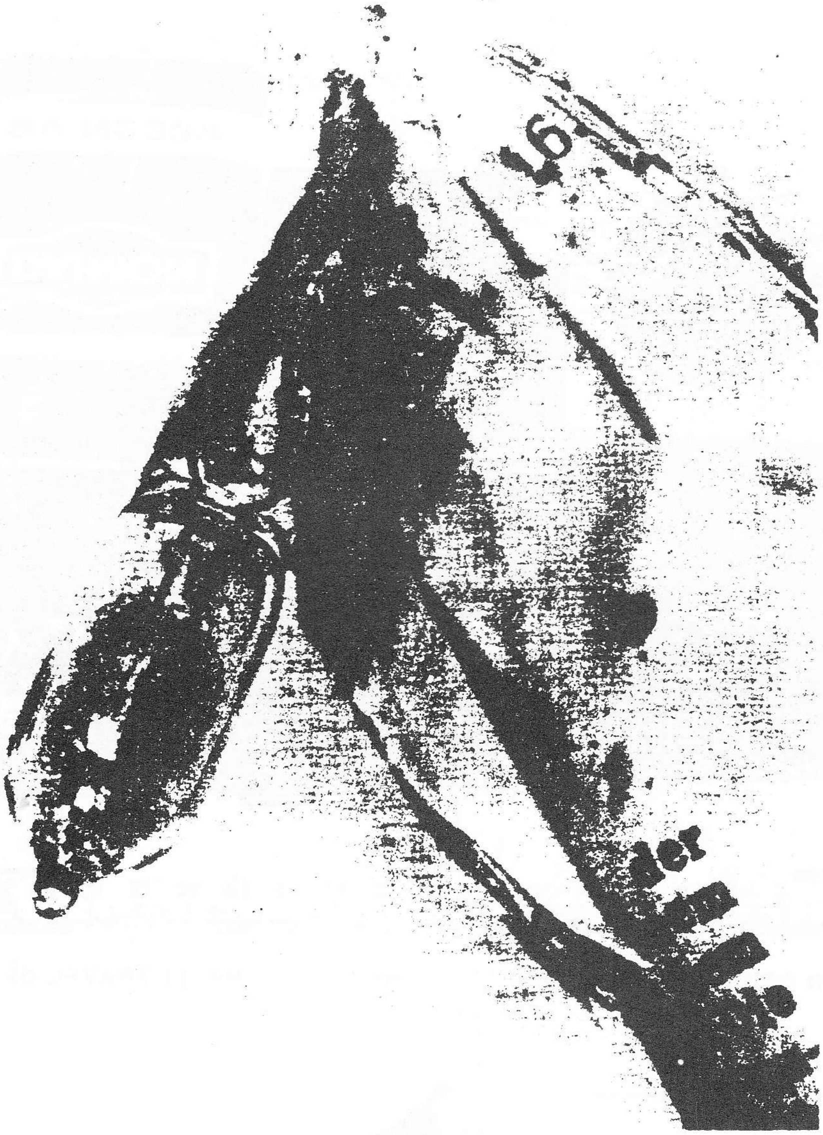


FIGURE 8: FLASHBULB FOR FUSE

After the timer was wound and the prescribed period of time elapsed, the nail attached to the winding pin would touch the metal strip of the door magnet. The battery charge would ignite the flashbulb with the primer charge (match heads) attached to it, initiating the device.

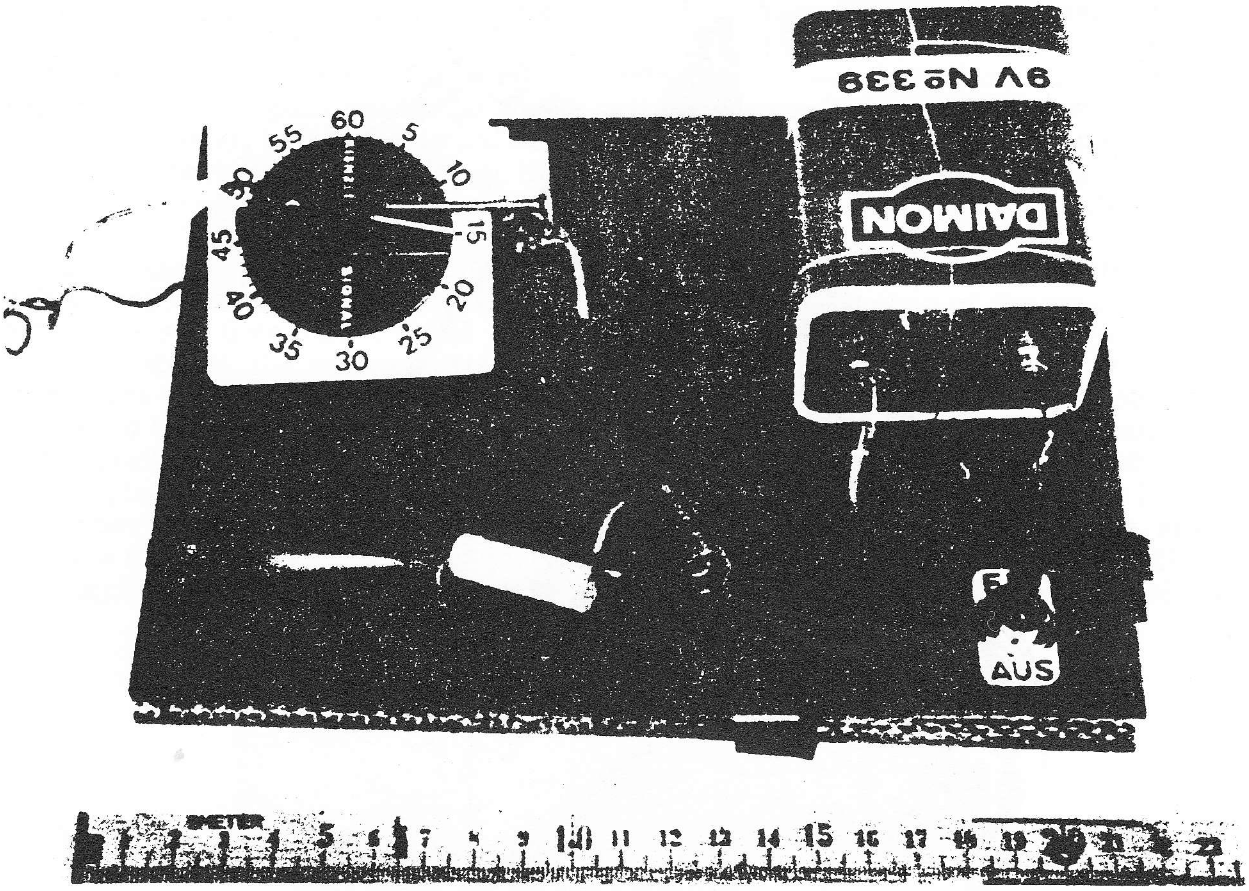


FIGURE 9: IGNITION DEVICE FROM ATTEMPTED BOMBING OF ISRAELI TRAVEL OFFICE

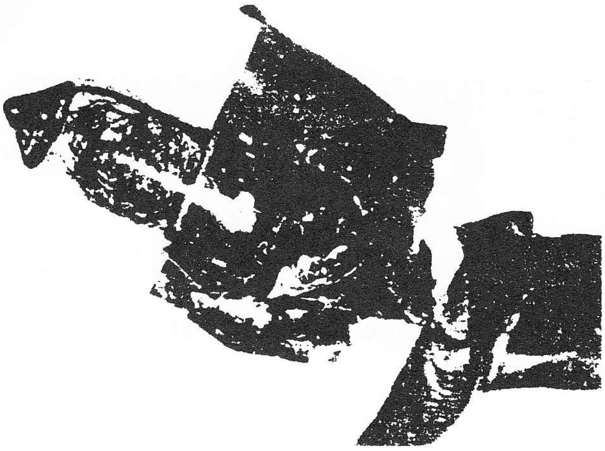
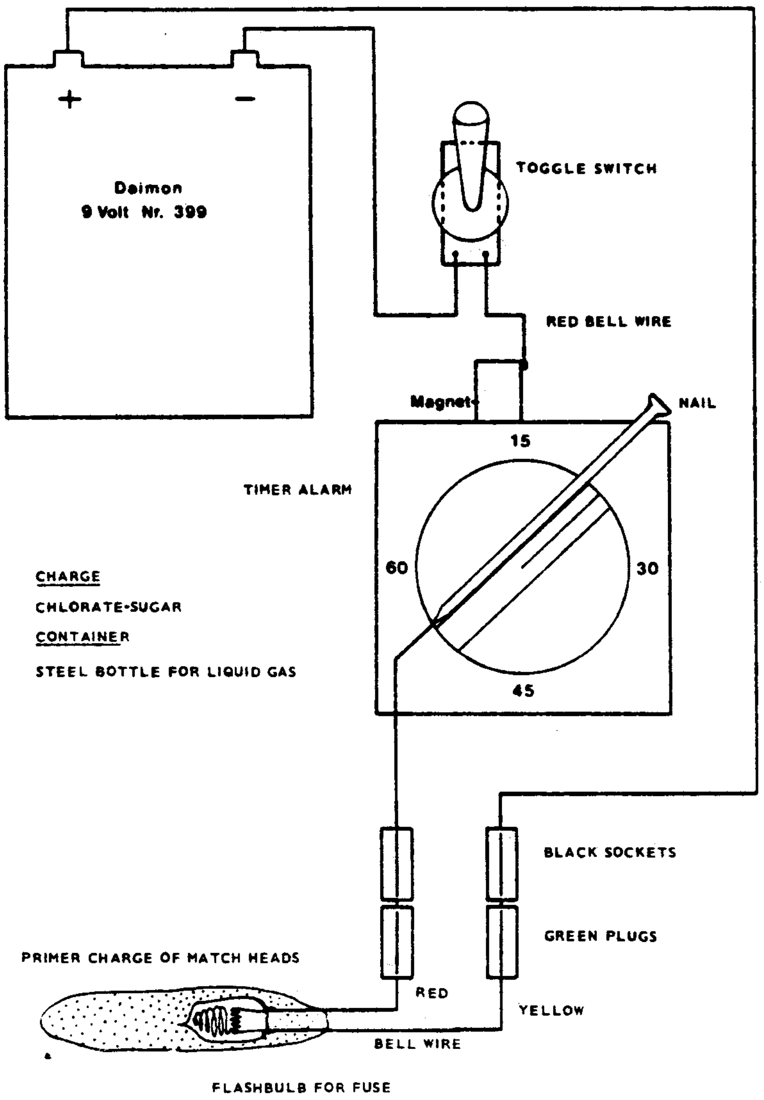


FIGURE 10: FLASHBULB USED

The examination and analysis of this unusual device enabled authorities to connect this case to: (1) the bombing of an Egyptian travel office in Berlin on January 19. (2) the attempted bombing of Berlin traffic operations on March 14, (3) the attempted bombing of an Israeli travel office in Berlin on March 30 and (4) the attempted firebombing of an attorney's motor vehicle on Berlin on May 31, See Figures 9 and 10.

FIGURE 11: CIRCUIT DIAGRAM



# LETTER BOMB EXTORTION PLOT

**1. Classification:** Restricted Technical Data.

**2. Subject:** Letter Bomb Extortion Plot.

**3. Source:** Domestic.

**4. Background:** On June 14, an envelope exploded in the mail room of a New York corporation office building injuring four people. This explosion, which was apparently related to extortion demands, heralded the beginning of a concerted letter bomb attack throughout the United States. By the end of that day eleven additional bomb devices had been received in the mail of corporate executives in seven cities. By the end of the next day, the total was 16. By Friday June 18, 18 letter bombs were received. All but one of the letter bombs have been successfully dismantled.

The extortion case which precipitated the rash of attempted bombings began in October, Letters were sent to about 200 corporate executives threatening retaliatory action if money was not deposited in a specific bank account. Some of the demands contained ticks purporting to carry dangerous diseases, and some included photographs of the addressees as seen through the cross hairs of a gun.

This bulletin contains a description of the recovered devices, as well as the dismantling procedure used by the New York City Police Department Bomb Section.

### TECHNICAL INFORMATION

Each device has been enclosed in a 9" x 12" or 10" x 13" manila envelope, and has been approximately 3/4" thick. Four pieces of cardboard, a 9 volt battery, an electric blasting cap (number 6), a matchbox (about 1" x 2" x ½") containing an ammonium nitrate and fuel oil mixture (ANFO), and a metal switch were used to construct each item. The ANFO was wrapped in metal foil before insertion into the box.

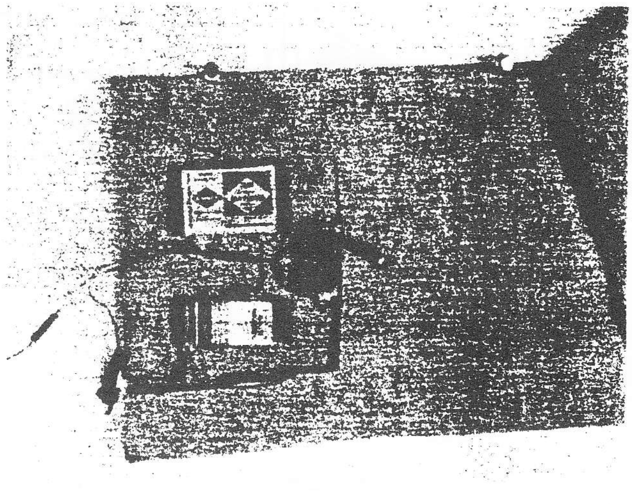


FIGURE 1: PHOTOGRAPH OF DEVICE COMPONENTS

Essentially all the devices were constructed in the same way, although there were minor variations. The battery, switch, and box containing explosive and blasting cap are secured to one piece of cardboard, which is fixed to the envelope. The battery and box are positioned near the bottom of the envelope, with the switch between them, slightly closer to the center of the cardboard sheet. See Figure 2. This cardboard base had a triangle cut from its top edge, so that it would not be removed with the other envelope contents. Two sheets of cardboard were glued together and a 5" x 6" section cut from one of the shorter sides. The edge of this is inserted between the contact points of the switch and provides insulation. A fourth piece of cardboard is placed over the entire device before insertion into the envelope. When the envelope is opened, the top sheet and insulator would be removed, completing the circuit.

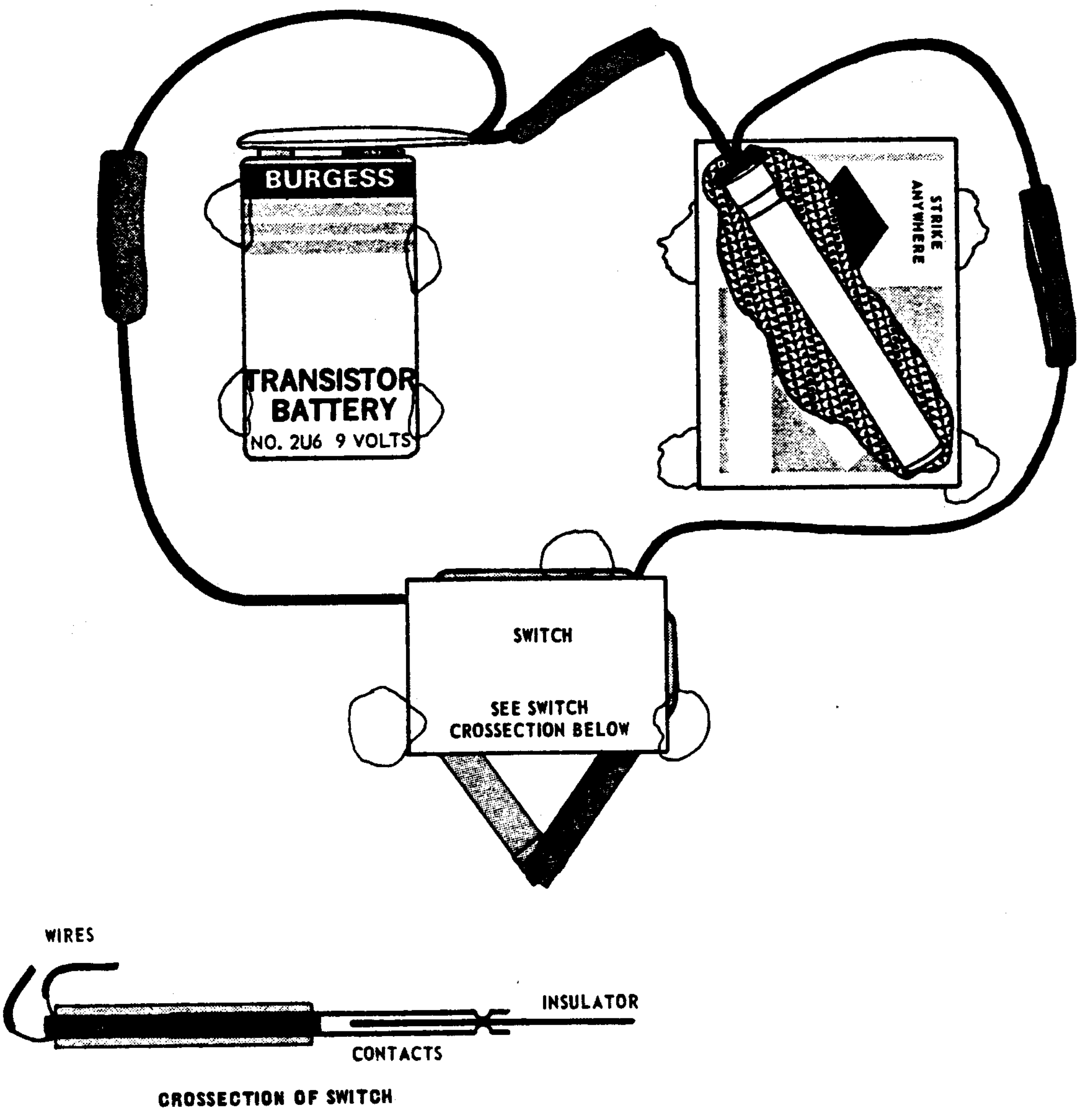
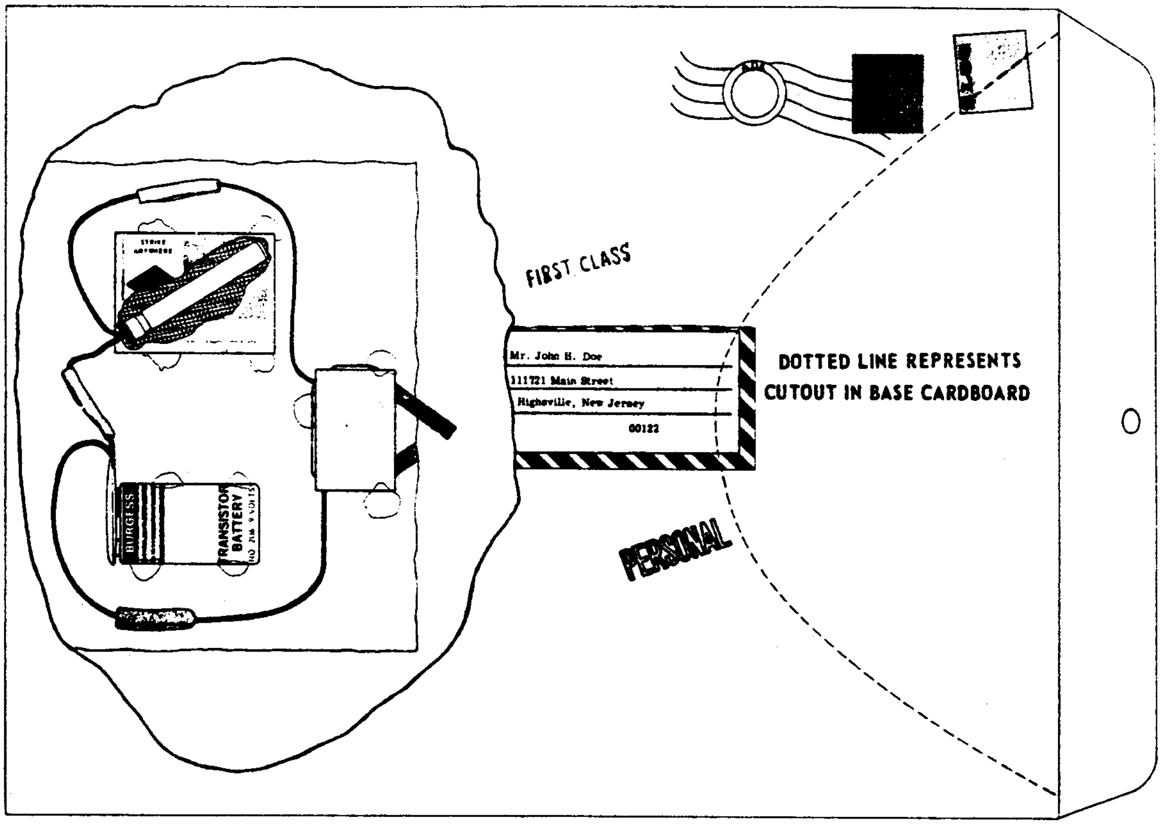


FIGURE 2: ARTIST'S CONCEPT OF TYPICAL DEVICE

The switches for these devices were constructed from Bakelite plates and metal tabs. For each switch, three plates were glued together. A metal tab was affixed to each outer plate in such a way that they would make contact, if an insulator were not inserted between them. The switch contacts are connected to the battery and one leg wire of the blasting cap. The other leg wire is fastened to the battery.



DOTTED LINE REPRESENTS CUTOUT IN BASE CARDBOARD

**FIGURE 3: DEVICE IN ENVELOPE (ARTIST'S CONCEPT)**

## DISMANTLING PROCEDURES

**THESE PROCEDURES, WHICH HAVE BEEN USED IN SPECIFIED INSTANCES TO DISMANTLE THE DEVICE, ARE PROVIDED FOR INFORMATION PURPOSES ONLY. PARTICIPANTS ARE REMINDED THAT THERE IS NO SAFE PROCEDURE FOR DISMANTLING ANY IMPROVISED EXPLOSIVE DEVICE.**

The following disarming procedure was used by the New York City Police Department Bomb Section.

- The envelope was taped down and x-rayed.
- At this time three items were identified: Two copper strips and an electric blasting cap.
- A slit was made in an edge of the envelope opposite from where the device was situated, and the paper of the envelope lifted up so that the components affixed to the cardboard were exposed.
- All four pieces of cardboard were slid simultaneously from the envelope. ALL CARDBOARD SHOULD BE REMOVED INTACT IN ORDER TO AVOID DISLODGING THE INSULATING CARDBOARD.
- The blasting cap was removed from the matchbox, the circuitry examined, and the leg wires cut.
- The device was examined to determine if any secondary improvised explosive devices were present.
- The remaining components were left intact to facilitate laboratory examination.

NOTE: If X-ray equipment is not available, the technician will be able to feel the battery and matchbox through the cardboard.

### COMMENT

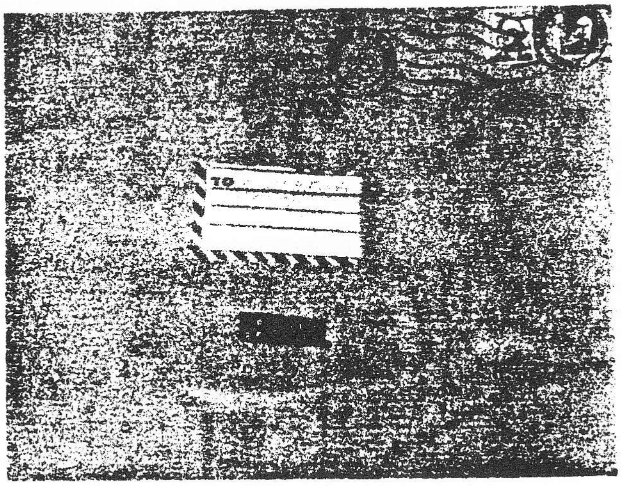


FIGURE 4: ENVELOPE SHOWING ADDRESS LABEL

Other devices of this kind may be received. Those already recovered have shown a typed address on either a blue-bordered white mailing label, or on dark brown gummed tape. See Figure 4. FBI BDP participants are warned to be aware of this type of letter bomb and to open with caution any manila envelopes of this description. Those received so far have been postmarked Texarkana or Atlanta, Texas. Personnel who open mail in large concerns and agencies, especially those that were targets in the extortion attempts, should be thoroughly briefed concerning the devices and possible danger.

# LETTER BOMBS

## LETTER BOMBS

**Source: Foreign.**

The postal system is a convenient means for sending an improvised explosive device (IED) to a particular target, including the postal service itself. Worldwide, scores of such devices have been encountered, and in recent years even greater numbers have been placed by terrorist groups for various social or political reasons.

Although letter bombs vary from device to device, there are relatively few basic types. This report describes examples of some of these basic types, and X-rays are included to assist technicians in recognizing some of the devices that could be encountered.

Keep in mind that this report is not intended to be used as the ultimate authority on the method of functioning of any postal IED, nor should it be assumed that letter bombs are limited to these examples.

### COMPONENTS AND PACKAGING

There are wide variations in package size, amount and type of filler, and IED weight. The amount of explosive and the type of initiating system are normally dictated by the thickness of the container. It is convenient to consider them in three size ranges: less than 6mm, 7mm to 30mm, and over 30mm.

LESS THAN 6MM: Letter bombs in envelopes thinner than 6mm would not generally cause suspicion. This size, however, imposes severe limits on what components can be used. One example employed a blasting cap which had been flattened in a vice, a spring-loaded firing mechanism made from a flat brass strip no thicker than 4mm, and filler compressed and rolled into a flat sheet approximately 2mm thick. (Refer to photograph of device no. 1.) Since commercial blasting caps in general have a diameter of approximately 7mm, this then must be the minimum thickness of any postal IED containing an unmodified detonator.

7MM TO 30MM: In the 7mm to 30mm thickness range (from thick envelopes to flat boxes, for example), a wide variety of explosives and components have been used. IED in this category have employed sticks or compressed packs of dynamite, bags of incendiary mix, and electric or nonelectric blasting caps or igniters, in conjunction with various power sources (from camera batteries to flashlight batteries), and all types of actuating mechanisms (pyrotechnic igniters, microswitches, contact foils, clothespins, improvised pull switches, clockwork delays, etc.).

In order to ensure that components 1) function correctly, 2) do not get jostled about while enroute through the postal system, and 3) cannot be felt through the outer wrapping, it is necessary to provide rigid support inside the package. If this is not carried out properly by the bomber, it is possible for the initiating system to become dislodged while enroute, posing the risk of premature detonation. Hollowed-out books, greeting card boxes, and thick card mounting boards have been utilized for this purpose.

LARGER THAN 30MM: In parcels greater than 30mm thick, it is not necessary to compress the bomb's components. Consequently, such devices can contain large explosive or incendiary charges in rigid boxes (cigar boxes or shoeboxes for example), or in an improvised box made from a wooden frame and covered with cardboard, or even inside a gift within a box.

Initiation systems have included switches such as microswitches, mousetraps, and improvised pull switches; timing devices such as alarm clocks and pocket watches; a wide range of batteries; and commercial detonators or electric gas igniters used for firing the charge.

### INITIATION SYSTEM

Where an IED is intended for a specific target (as opposed to a device which will fire at a pre-set time no matter where it is), target participation is required. This includes such actions as opening a letter by inserting a letter opener, undoing an envelope flap, untying a string, lifting a lid, or removing the parcel's contents. It is unlikely that the bomb in its unopened state would be triggered simply by handling it, since it has already gone through various types of postal machinery before arriving at its destination. And, of course, it has been designed with this in mind. This means that the initiating system of a postal IED which is intended for a specific target must be based on any manipulating that is necessary to open or separate the inner contents from the wrapping.

(NOTE: This conclusion should never be a reason for handling a suspect device with less than the greatest of caution, since safety depends largely on how well the device was made.)

All initiation systems have one thing in common — they are designed to produce a flame. The flame is directed either into an incendiary mix to start a fire, or into a detonator to start an explosion. This can be achieved chemically, mechanically, or electrically.

CHEMICAL INITIATION: This process is based on mixing two chemicals to produce a flame. Systems which have been encountered usually employ a liquid and a solid, which normally are quite stable when kept separate. Initiation occurs when a frangible container of the liquid is broken or an open-ended vessel containing the liquid is inverted, allowing the liquid to mix with the solid. Obviously this latter system is unreliable since it could function while being handled during delivery. For this very reason, though, it has been utilized to attack postal service facilities. In an incident involving the postal service, the explosive device contained a rubber condom which had been coated internally with wax and filled with a liquid chemical. Handling the package by postal employees caused the wax lining to break, thus allowing the liquid to dissolve the rubber and mix with a solid, which in turn caused a fire.

MECHANICAL INITIATION: There are three versions of mechanical initiation systems which have been used: impact, friction, or puncture. An impact system requires a blow to be delivered to a sensitive composition in a small container. An arrangement in one device caused a shotgun cap to be struck a light blow by a spring driven hammer. The hammer was released by a sensitive trigger which was held down by a folded card inside an envelope. The device would not fire until pressure by the envelope and folded card on the trigger was lifted. This type of initiation system is described as "mechanical, pressure release" (see device no. 1).

Matches and sandpaper could comprise a friction-type initiating system. The matches could be arranged to scrape along a piece of sandpaper when the inner letter was pulled from its envelope. Device no. 2 is an example of another friction-initiated IED.

A puncture system has been reported where a needle was positioned in the mouth of a nonelectric blasting cap (nbc) inside an envelope. Removal of the inner paper pulled the needle into the detonator, thus pricking the sensitive explosive inside. This is very unreliable, since it is difficult to produce enough energy to initiate the sensitive composition.

ELECTRICAL INITIATION: Electric initiating systems produce a flame or spark using an ignition wire heated to incandescence by its resistance to an electric current which is passed through it. Such wires are to be found in flashlight bulbs, gas lighter heads, electric blasting caps (ebc); and they can be improvised from steel wool. To be operative, an electric initiation system must contain a switch and power source, as well as the ignition wire.

An electric switch consists of two metal contacts which are normally held apart to interrupt the electric current. When allowed to touch each other, these contacts complete the IED's electric circuit, allowing the current to flow from the power source to the detonator. Switches which have been used in postal IED are mostly homemade from soldered wires (device no. 3), pieces of aluminum foil (devices 5, 6, & 7), brass strips (device no. 8), clothespins (device no. 9), and bared looped wires (device no. 10). The most common commercially produced switches used have been microswitches (device no. 4).

Where one contact in a switch has a force which acts directly on it to keep it apart from another contact, then cancellation or release of that force (for example, by opening a postal IED) will cause the contacts to close and allow an electric current to flow. This release of force describes the action of the initiation system — in this case, it would be described as "electric, pressure release".

Where one contact in a switch is held apart from another by an insulator between them, activation of the switch is caused by removing the insulator, thus allowing the contacts to touch. Insulator removal can be achieved by removing the inner explosive container complete with the electric contacts from a package, leaving the insulator behind in the outer container (device no. 9). Reversing the procedure will also produce the desired removal of the insulator (that is, by leaving the other components in place and removing the insulator).

Device 5 is an example of contacts made from aluminum foil and an insulator made from card. It is described as "electric, insulator removal, card/foil". In device 8, the contact support was made from a "C" shaped piece of plastic, and the initiation system is therefore described as "electric, insulator removal, 'C' switch".

Where electric contacts are normally apart and require a force to be applied to make them meet, this can be achieved, for example, by allowing two bare wires to touch. The action involved is the drawing together of the contacts to complete the circuit, and it is characterized in this report as "electric, draw wires, two wire".

It can be difficult and extremely dangerous to assemble explosive devices of the postal type, and safety measures normally have to be used. One such method is to incorporate into the electrical circuit a second switch that can be closed after the device has been assembled. By doing this, if the first switch should accidentally close during device assembly, no functioning can occur because the circuit is still broken by the second safety switch. An easy method of ensuring that the safety switch is closed after the device has been assembled is to manufacture a switch from a timing mechanism and set this in motion before completing and sealing the device. Devices with time switches included in their electric circuits can be used with any other electric switch mentioned above. Thus a box bomb using a microswitch with a pocket watch arming switch would be described as "electric, pressure release, delayed arming (device no. 4). Similarly, a book bomb using aluminum contact foils in the circuit, with a wristwatch arming switch would be described as "electric, insulator removal, card/foil, delayed arming" (device no. 6).

## POWER SOURCES

Power sources for postal bombs are limited in size where there is a restricted thickness of package; thus in letter-sized IED a battery thicker than 5mm cannot be used. The only batteries available would be single cell camera or exposure meter batteries (see devices 3, 5, 6, & 7). The thin batteries now used in Polaroid SX70 film packs could also be used, but have not appeared so far. In the middle thickness range, batteries such as a 9V transistor radio battery (see devices 9 and 10) or a 15V camera flash battery (device no. 8) are the most popular type employed, since a flat 4½V battery (see device no. 4) takes up too much room in a book or a very small box.

## X-RAY DETECTION AND RECOGNITION

Detection of postal bombs by an organization in receipt of a large amount of mail presents an enormous problem which an individual receiving a single suspicious envelope does not have. For mass screening, equipment based on vapor detection, metal detection, radiation back-scatter, and X-ray have all been designed and used. A combination of metal detection and X-ray may be the most satisfactory.

Most IED contain some metal. Logically, therefore, the first step in screening mail is to pass it through a metal detecting system. From here, the assumption often is that if there is no metal present, then there is probably no IED and this mail can be delivered normally. Unfortunately, this may no longer be true since recently a home-made plastic sheathed detonator has appeared in the Middle East and this, combined with a pull string/matchhead igniter, would not be detected. X-ray can be used for further examination of mail which has no metal present.

Detection by X-ray apparatus is based on an operator looking at X-ray images on a fluoroscopic screen or TV monitor, carefully examining the details seen on the screen to decide whether a package needs further investigation. The interpretation of the image requires a high degree of skill to ensure that nothing is missed. Therefore in any case of doubt, an expert should be consulted.

Recongnition that a packet needs investigation can be achieved by looking for specific points in the X-ray image. The following, in the form of a checklist, are suggested as a possible guide. If the answer to any of the checks should be positive then the package must be considered suspicious.

The first decision in any device is whether or not a detonator or igniter is present. Most detonators and igniters are manufactured in the form of a tube ranging in diameter from 5 to 10mm. So, the first check would be:

1. IS THERE A TUBE PRESENT WHOSE DIAMETER IS BETWEEN 5 AND 10 MM?

This tube may or may not have wires coming from it and may or may not be totally opaque to X-rays. If it is not opaque it will have dark bands, blobs or triangular-shaped areas inside it on the X-ray image, since the explosive used in these tubes contains lead or mercury which absorbs X-rays.

As a further check:

2. DOES THE TUBE HAVE DARK BANDS, BLOBS, OR TRIANGLES IN IT?

3. DOES THE TUBE HAVE WIRES COMING FROM IT?

Electric igniters which have been made from flashbulbs or steel wool would have to be buried in some incendiary composition to make an IED. This combination of flashbulb and/or incendiary mix shows up under X-ray as a grey "fuzzy" area, and wires coming out of such an area would indicate that an igniter is present. This check can also apply to some electric detonator/explosive systems. Ignition wires incandesce enough when a small current passes through them to ignite a sensitive composition. All electric detonators contain such a wire which is normally buried in a sensitive composition and thus cannot be seen under X-ray.

4. IS THERE A GREY "FUZZY" AREA WITH WIRES COMING FROM IT?

Where wires are present, then a battery will be connected to them somewhere. Any packet containing a battery should be considered suspicious, including packets containing transistor radios or flashlights. Batteries take several forms but all show up under X-ray as one or more discs greater than 15mm diameter or rectangles which may or may not contain dark bands. If wires are connected to them they are suspect, leading to this check:

5. IS THERE AT LEAST ONE BATTERY WITH WIRES CONNECTED TO IT?

As a safety measure, some devices have employed a clockwork timing mechanism in the form of a watch, modified by connecting wires to it to act as a second switch in an electric circuit. So a final check would be:

6. IS THERE A WATCH PRESENT WITH WIRES CONNECTED TO IT?

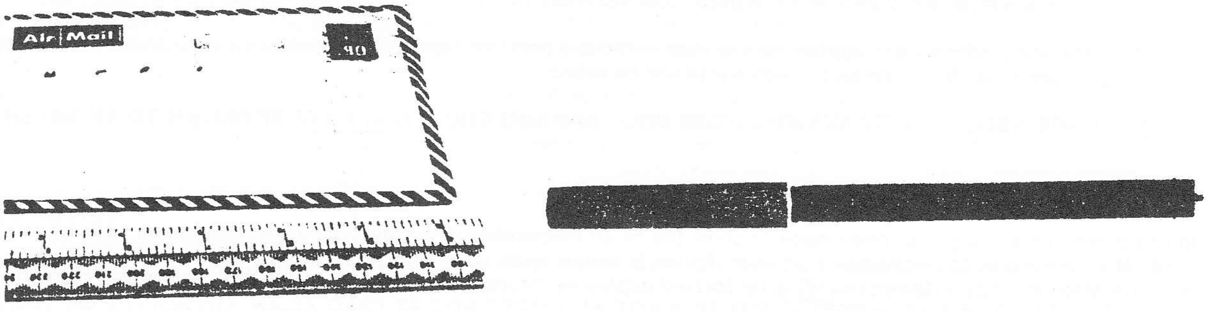
Even if all the above checks are applied to a packet without a positive result there could still be a doubt, for example a match/glasspaper initiation system which would not be seen.

ANY PACKAGE ABOUT WHICH ANY SUSPICION STILL REMAINS SHOULD ALWAYS BE SHOWN TO AN EXPERT.

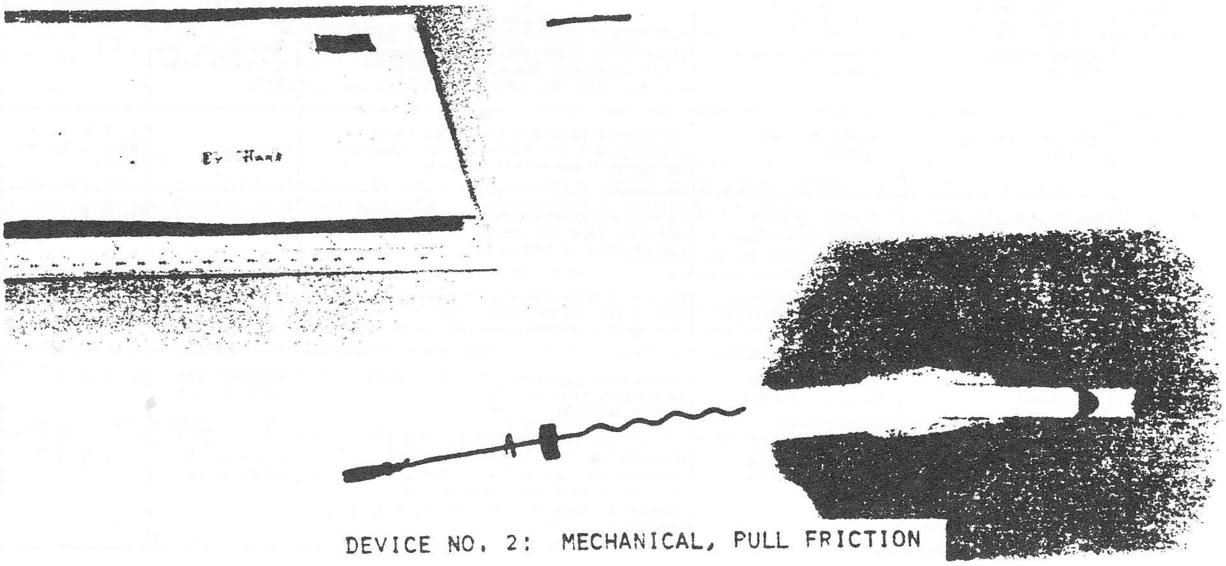
## COMMENT

In this report an attempt has been made to show the basic mechanism of a selection of devices which have been used. It is important to emphasize that each device is unique even when similar initiating systems are used, and neutralization must be attempted ONLY by trained explosive disposal technicians. THIS REPORT IS INTENDED TO HELP IN RECOGNIZING A POSTAL IED; IT IS NOT AND MUST NOT BE USED AS AN AUTHORITY ON THE METHOD OF FUNCTIONING OF ANY IED RECOGNIZED USING X-RAY DETECTION METHODS.

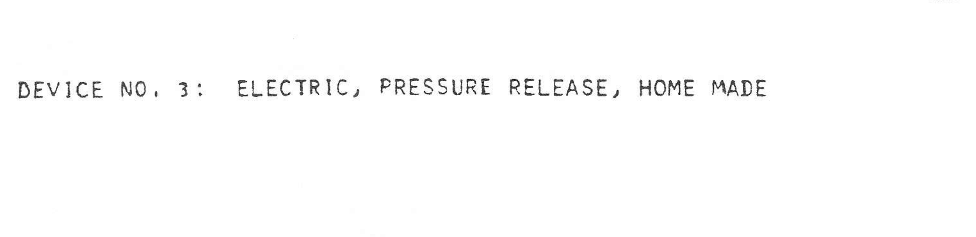
| Device No. | Container & Dimensions (mm) | Initiation System | Description of Components | X-ray Features | Recognition Checklist References |
|---|---|---|---|---|---|
| 1 | airmail envelope 160x110x6.5 | mechanical, pressure release | spring-driven striker mechanism, flattened copper nonelectric blasting cap, military explosive rolled into sheet 2mm thick | explosive too thin to be seen under X-ray | 1 & 2 |
| 2 | light color envelope 250x200x12 | mechanical, pull friction | hollowed-out paperback book (200x145x10) containing pull wire friction igniter, aluminum nbc buried in commercial explosive | | 1, 2, 4 (out of context, but can apply) |
| 3 | light brown envelope 230x95x15 | electric, pressure release, improvised | improvised, spring operated switch, copper ebc, flat single cell battery (23 mm dia.), cut lengths of detonating cord | | 1. 3, 5 |
| 4 | cardboard box wrapped in brown paper 165x110x75 | electric, pressure release, microswitch delayed arming | gas igniter head, flat 4.5 volt battery, microswitch, pocket watch, sugar/chlorate mix, gelatin capsules containing lighter fluid | incendiary mix shows very faintly | 1, 3, 4, 5, 6 |
| 5 | brown manila envelope 200x135x11 | electric, insulator removal, card/foil | hollowed-out paperback book (180x110x10), copper ebc, single cell flat battery, commercial explosive, foil contacts | aluminum foils cannot be seen | 1, 3, 4, 5 |
| 6 | brown manila envelope 300x250x12 | electric, insulator removal, card/foil | aluminum ebc, flat single cell battery, aluminum foil, and coil of detonating cord mounted on white card (295x200); wall calender as insulator; other foil on inside of envelope | aluminum foils cannot be seen | 1, 2, 3, 5 |
| 7 | brown manila envelope 195x135x14 | electric, insulator removal, card/foil, delayed arming | hollowed-out paperback book (175x110x13), aluminum ebc, flat single cell battery, wristwatch, commercial explosive, foil contacts | aluminum foils cannot be seen | 1, 2, 3, 4, 5 |
| 8 | white greeting card box 285x235x18 | electric, insulator removal, "C" switch | copper ebc, camera flashbulb battery, commercial explosive, "C" shaped plastic with brass contacts, all glued to bottom of box; plastic insulator between contacts and attached to box lid with a thread | insulator and thread cannot be seen | 1, 3, 4, 5 |
| 9 | 195x130x31 packet wrapped in brown paper | electric, insulator removal, clothespin | hollowed-out book (190x125x28) containing copper ebc, transistor radio battery, plastic explosive, clothespin with drawing pins in jaws, plastic insulator between jaws attached by cord to protective box holding book | insulator very faint | 1, 3, 4, 5 |
| 10 | white envelope 320x225x28 | electric, draw-wire, two wire | hollowed-out book (240x170x27) containing aluminum nbc converted to electric operation by using a broken torch bulb to provide ignition, transistor radio battery, bared wire loops, wire "saddle" in book cover with one wire loop through it | | 1 2, 3, 4, 5 |



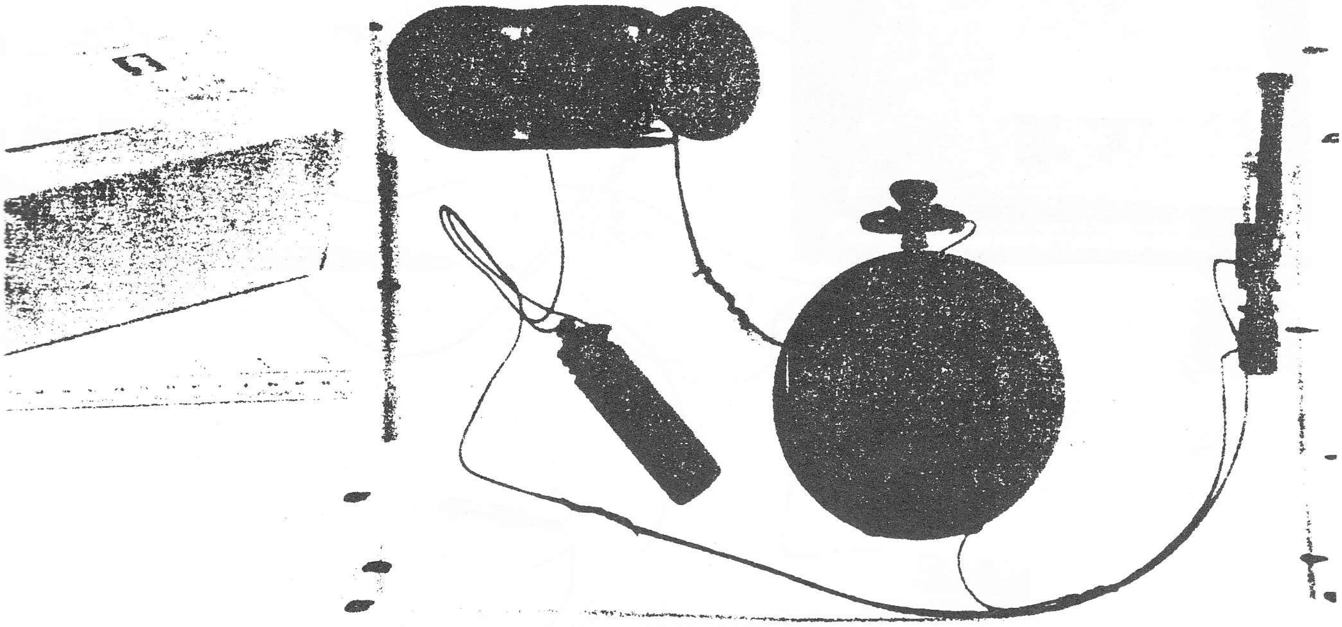
DEVICE NO. 1: MECHANICAL, PRESSURE RELEASE



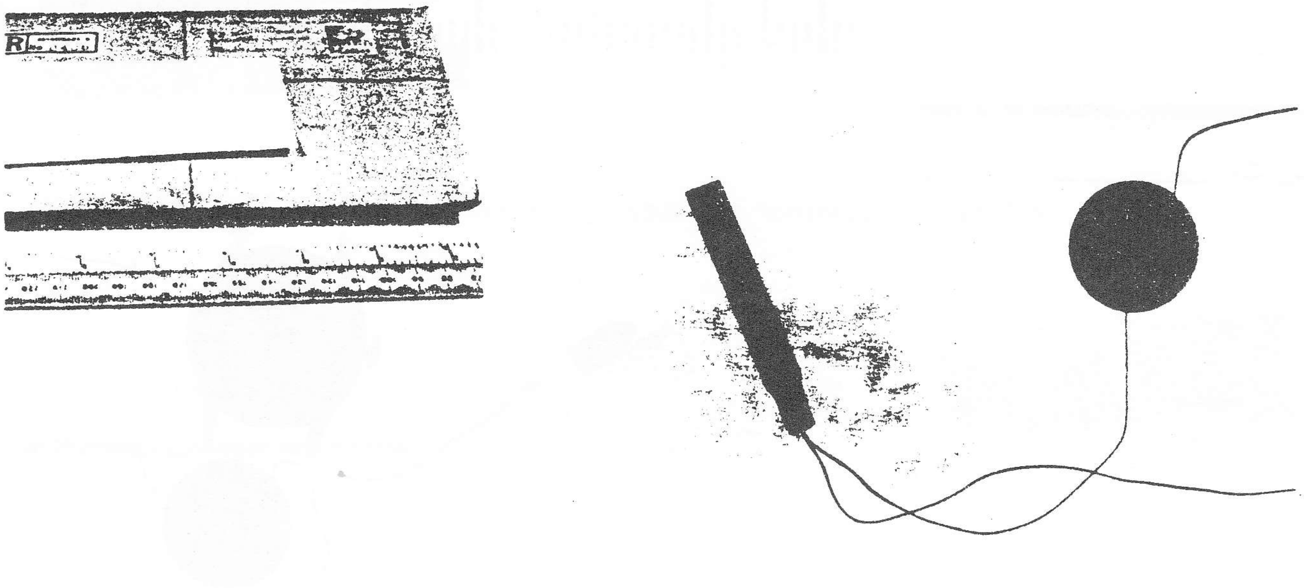
DEVICE NO. 2: MECHANICAL, PULL FRICTION



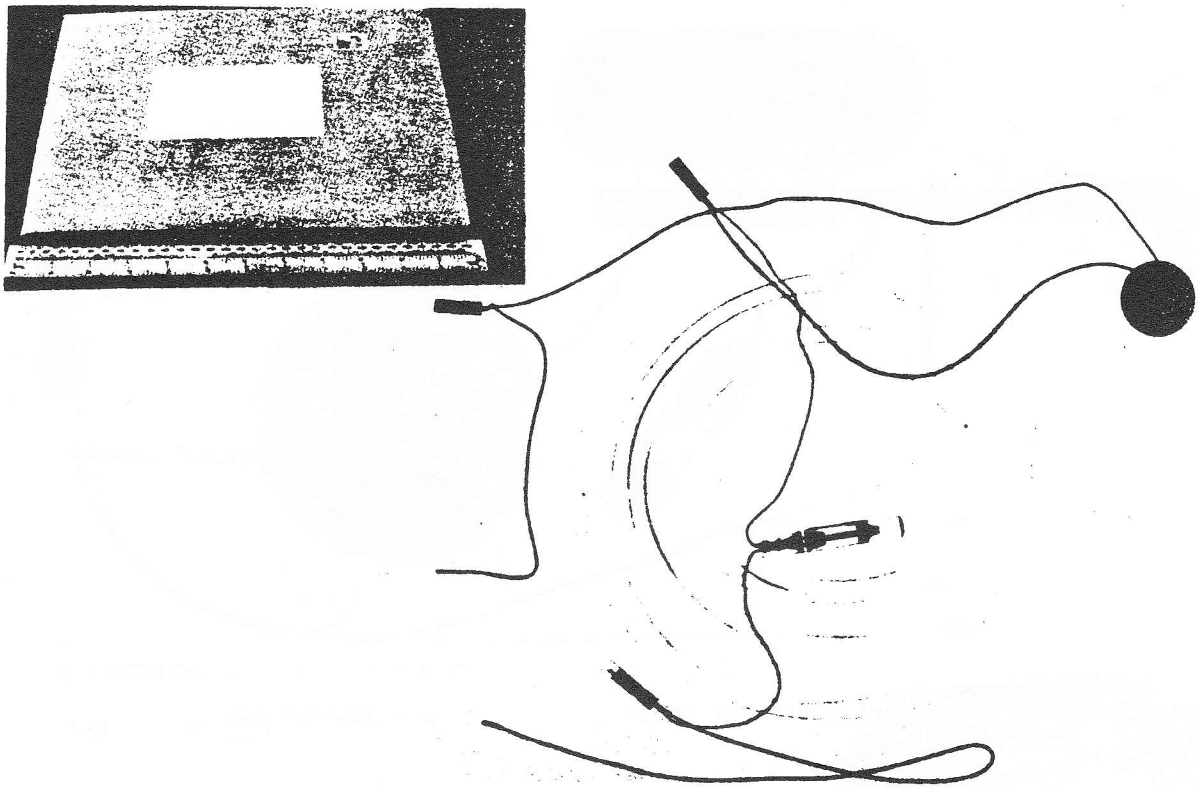
DEVICE NO. 3: ELECTRIC, PRESSURE RELEASE, HOME MADE



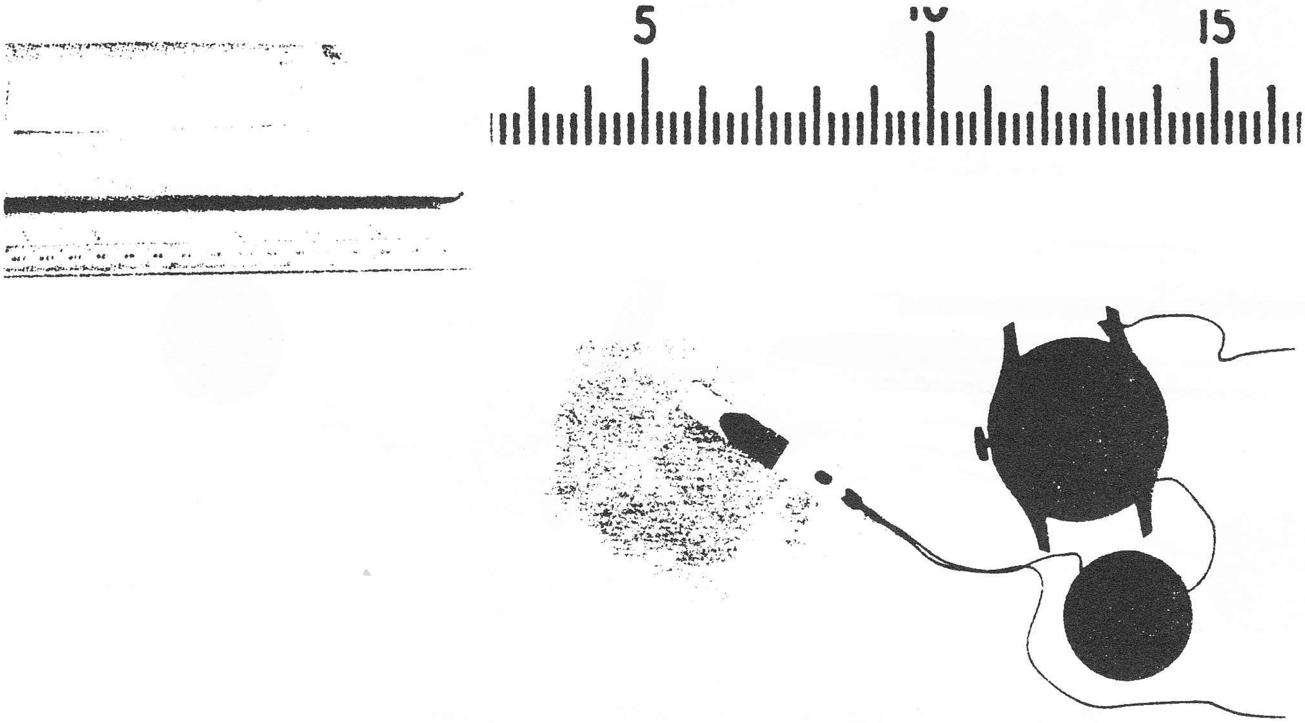
DEVICE NO. 4: **ELECTRIC, PRESSURE RELEASE, MICROSWITCH, DELAYED ARMING**



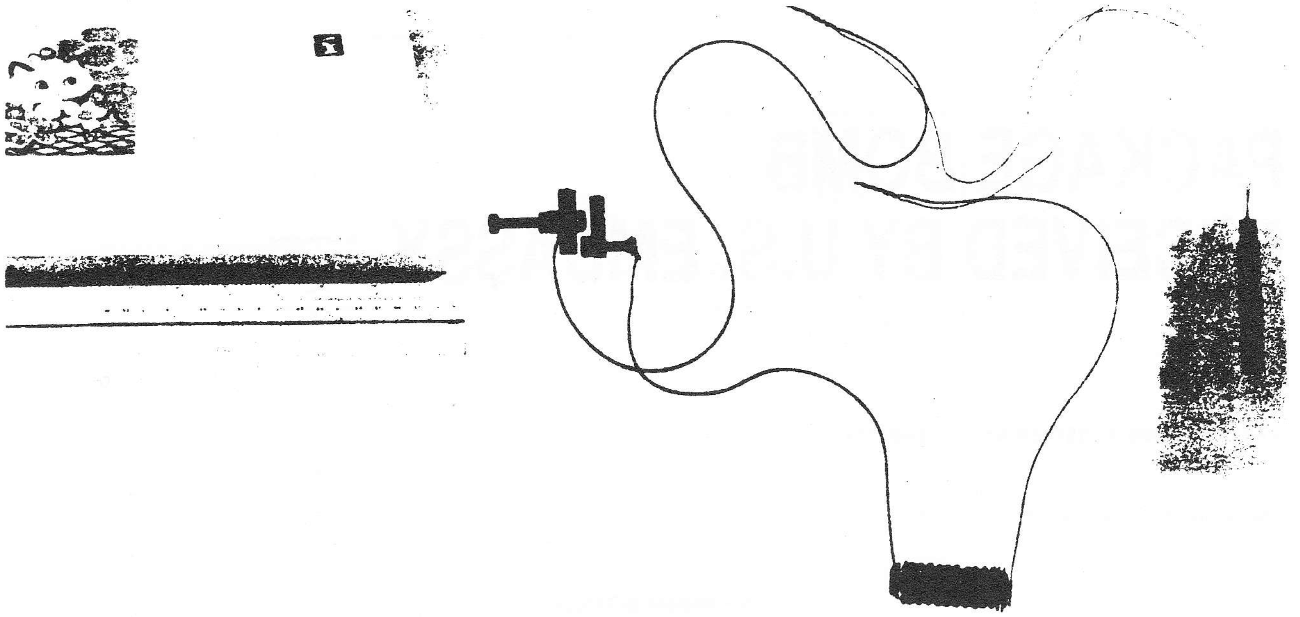
DEVICE NO. 5: ELECTRIC, INSULATOR REMOVAL, CARD/FOIL



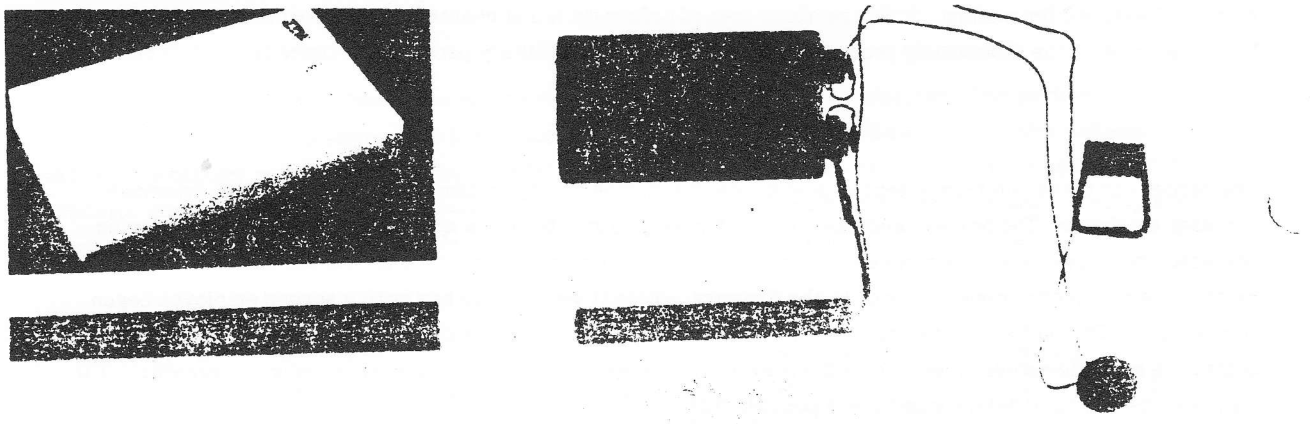
DEVICE NO. 6: ELECTRIC, INSULATOR REMOVAL, CARD/FOIL



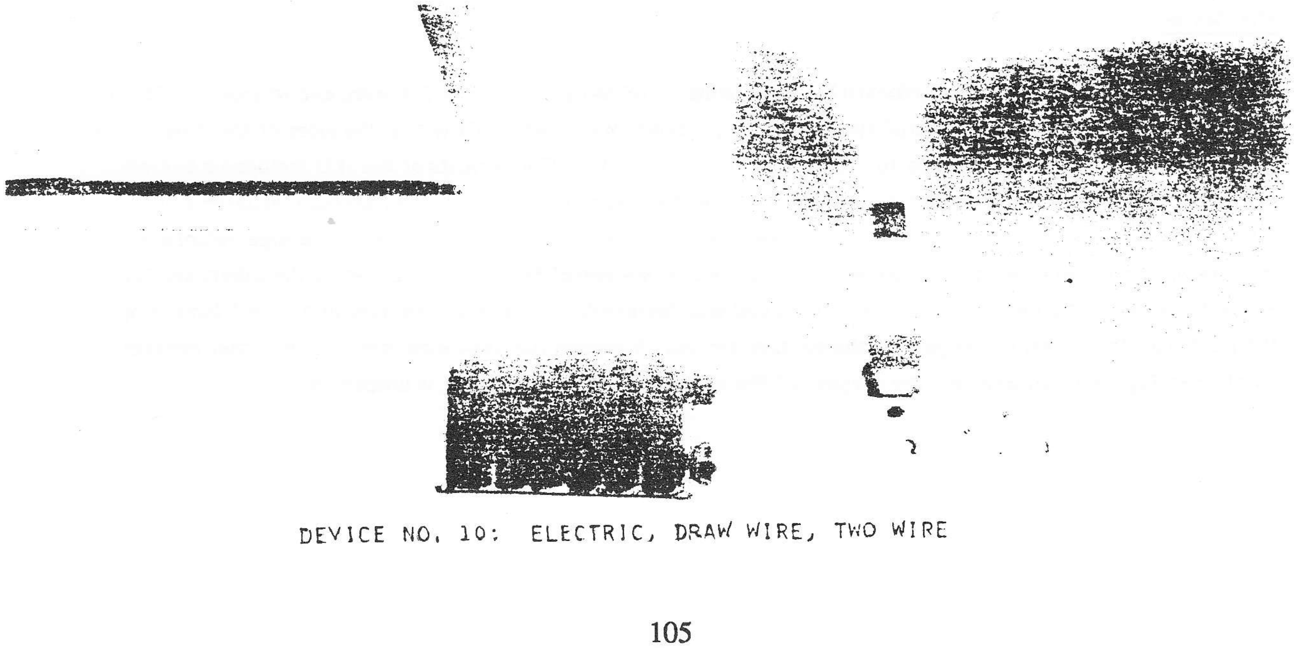
DEVICE NO. 7: ELECTRIC, INSULATOR REMOVAL, CARD/FOIL, DELAYED ARMING



DEVICE NO. 8: ELECTRIC, INSULATOR REMOVAL, "C" SWITCH



DEVICE NO. 9: ELECTRIC, INSULATOR REMOVAL, CLOTHES PIN



DEVICE NO. 10: ELECTRIC, DRAW WIRE, TWO WIRE

# PACKAGE BOMB
# RECEIVED BY U.S. EMBASSY

**PACKAGE BOMB RECEIVED BY U.S. EMBASSY**

**Source: United States Department of State.**

The receipt of a postal bomb by an American Embassy in Europe was recently reported to the FBI Bomb Data Center (BDC). The improvised explosive device (IED), which contained an incendiary mixture, was enclosed in a box and wrapped for mailing. It was partially opened before its lethal character was suspected. This incident, including some of the disassembly procedures undertaken by U. S. Military personnel, is described in this bulletin.

The parcel was picked up from a central post office in a European city on December 27, by an American Embassy employee. The box was addressed to the Embassy rather than to a specific individual, and printing on the wrapping indicated that it contained a free sample. The employee began to open the box at the time of receipt but subsequently brought it back to the Embassy, where it was undisturbed until a second employee began to unwrap it. This individual, having observed a wire and battery within the parcel, became suspicious and resealed the box. He turned it, as well as the previously removed outer wrappings, over to security personnel. The item was X-rayed and determined to be a possible IED.

## The Device

The IED was enclosed in a gray cardboard box measuring 3 inches by 4 inches by 3/4 inch, and wrapped in Christmas wrapping paper. The box consisted of two five sided portions, one of which fit within the sides of the other. The lid was taped with electricians tape to the bottom on all four sides. Components of the IED included a battery, a wire contact switch, and a packet containing the incendiary substance as well as a flashbulb initiator and a bullet. The material in which these latter two items were embedded appeared to have been a sugar/chlorate mixture or similar compound. The battery was situated at one end of the box; the packet at the other; and the contact wires in the center. One battery terminal was fastened, by means of a battery clip, to a filament of the flashbulb; the other, to one part of the contact switch. A second filament wire provided the other contact point. See Figure 1, Schematic. The purpose of the cartridge within the packet is unspecified.

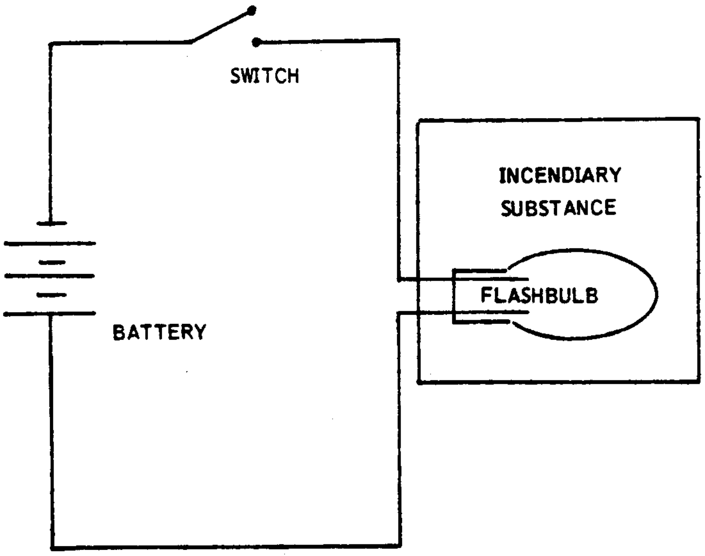


FIGURE 1: SCHEMATIC DIAGRAM OF IED

The contact switch appears to have been constructed from heavy wires twisted together. One portion of it, the line from the flashbulb, was fastened to the bottom of the box and positioned perpendicular to this surface. The line from the battery was threaded through the lid of the box and affixed to a card holder on the exterior of the cardboard. Removal of the lid, or manipulation of the card and holder, would permit contact and the completion of a circuit through the flashbulb. Its activation would, in turn, ignite the incendiary substance.

The suspicious parcel was X-rayed prior to the notification of bomb disposal personnel. See Figure 2.
The technicians, having examined the item with X-ray equipment, implemented the following procedures. The disassembly process took place in an Embassy parking lot, which had been cleared and secured.

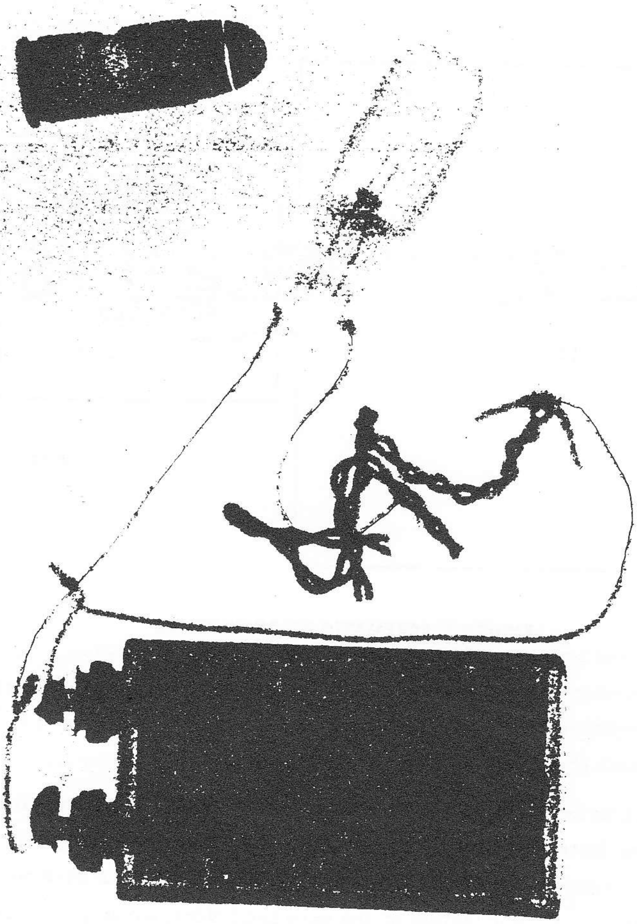


FIGURE 2: X-RAY OF IED FROM THE TOP

- The parcel was taped to a tool box on the bomb disposal vehicle in order to immobilize it during entry.
- The position of the battery was clear from the X-ray, and a small access port was cut in the box adjacent to its terminals. Through this aperture, the battery terminal clip was removed from the cell.
- The parcel was then prepared for remote opening by removing the tape used to immobilize it. A loop of filament tape was affixed to the lid. A second loop was placed on the tool box and the parcel inserted into it. This would secure the bottom of the box to the vehicle while the lid was being remotely removed.
- A lanyard was attached to the loop on the lid; threaded over a ladder mounted on an overhead rack of the vehicle; and passed down the other side of the vehicle. This method affords the combined protection of distance and the vehicle between IED and technician.
- All tapes securing the lid and bottom of the parcel to one another were then severed and an attempt was made to remove the lid by pulling the lanyard. It was unsuccessful due to the oblique angle of pull.
- The IED was then repositioned directly below the ladder in order to permit a direct vertical pull. The next attempt to remove the lid by means of the lanyard was also unsuccessful.
- Subsequently, the accidental detonation of the IED resulted in one injury.

This disassembly procedure has been detailed in this bulletin in order to re-emphasize the hazards and uncertainties of these activities, even when undertaken with caution and expertise.

### COMMENT

A note found within this IED included various anti-American slogans and phrases attesting to the national sovereignty of the European country involved. A logo and the name of a quasi-revolutionary organization appeared on its reverse.

# PHOTOELECTRIC FUZING IN IMPROVISED EXPLOSIVE DEVICES

1. **Classification: Restricted Technical Data.**

2. **Subject: Photoelectric Fuzing in Improvised Explosive Devices.**

3. **Source: a. Foreign.**
   **b. Picatinny Arsenal, Dover, New Jersey.**

4. **Background:** The discovery of improvised explosive devices (IED) with photoelectric (light sensitive) fuzing systems has been reported to the NBDC by a European country.

The purpose of this bulletin is to explain the basic concept of photoelectric fuzing, to describe the major components found in the recovered IED, and to alert NBDC participants to a number of commercially available components which might be encountered in similar devices.

## TECHNICAL INFORMATION

### General

Improvised explosive devices vary inevitably in some details; however, the basic design of any light actuated IED will include an explosive charge, one or more electric initiators (blasting caps, squibs, etc.), a power source, and a photoelectric circuit.

The photoelectric circuit, which constitutes the fuzing system, will contain a photoelectric component, an amplifier, and one or more switches mounted on fiberboard or a similar rigid material.

### Commercially Available Components

Although light sensitive fuzing systems are generally more complex than the fuzing usually encountered in IED, they can be constructed by a knowledgeable amateur from the commercially available components described below.

- **Photoelectric Components**

Either a photocell, a photodiode, a phototransistor or a photovoltaic cell may be used as the photoelectric component in the fuzing system.

The **photocell** (or photoconductive device) is a resistor which has its resistance decreased when exposed to light. A typical photocell is illustrated in figure 1, which shows a mock-up of a light sensitive fuzing system constructed by the NBDC. The transparent window in the photocell case is typical of a photoelectric device, which must have a transparent case or window to admit light.

Although smaller and different in internal construction, **photodiodes** are similar to and may be used in lieu of photocells. **Phototransistors**, which are comparable in size and weight to photodiodes, differ primarily in their sensitivity to light, which is at least ten times that of a photodiode or photocell.

The **photovoltaic cell**, another type of photoelectric device, generates an electric current when exposed to light. This current, when amplified, can be used to operate a switch and, ultimately, to detonate an electric blasting cap. This type of cell is also known as a **solar cell.**

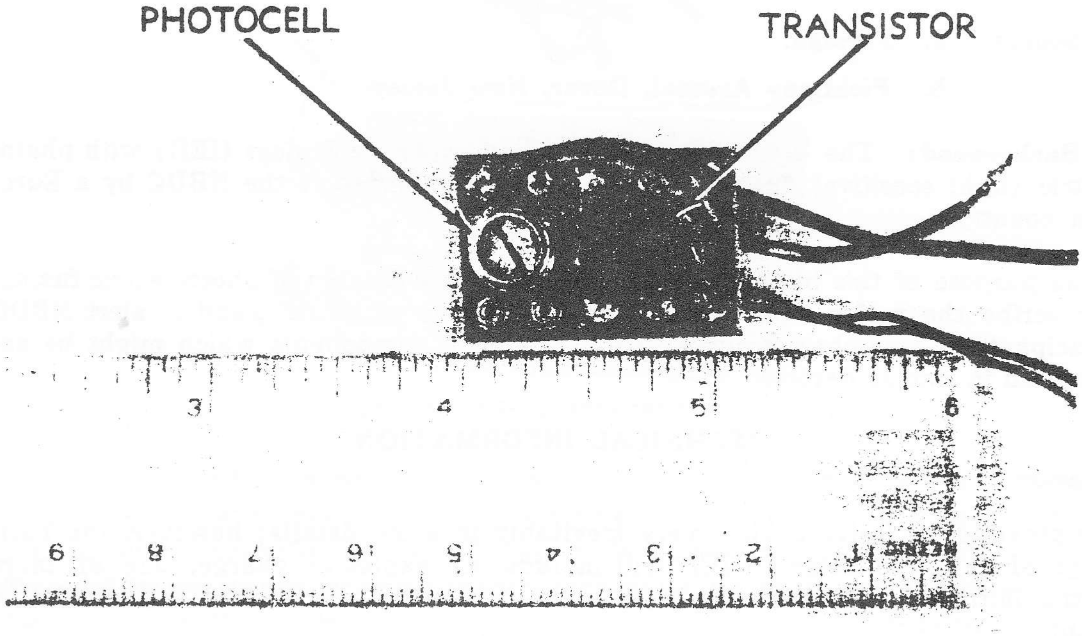


Figure 1. Mock-up of Photoelectric Fuze

- **Amplifiers**

An amplifier serves either to increase the very low voltage generated by the photovoltaic cell, or to detect the change in resistance of a photocell, photodiode, or phototransistor in order to trigger the switching device.

A **direct coupled (DC) amplifier** is used with photoconductive devices more often than a **resistor-capacitor (RC) amplifier** because the DC amplifier is more compact and contains few, if any, capacitors. The amplifier may be a combination of individual components (such as rheostats and variable resistors) or an integrated circuit.

- **Switches**

A **relay**, a switching **transistor**, or a **thyristor** (a solid state relay) may be used as the switch in a photoelectric device. A transistor was used in the fuzing system shown in figure 1.

## Description

The IED described below were in various stages of construction when they were recovered. In some cases, only the drawings and diagrams of the electrical circuitry were recovered rather than the actual components, and these were used when necessary as the basis of the descriptive material.

### • IED No. 1

Although this IED was not fully assembled when it was discovered, a copy of the electrical circuit recovered with the fuzing system indicates that a photocell was to have been one of the major components.

In addition to the photocell, the fuzing system consisted of two transistors (TR 1 and TR 2), two rheostats, and a relay. The power source was a 9 volt battery.

As shown in figure 2, a connective wire leading from the fuzing system was attached to the positive battery terminal. One of the blasting cap leads was attached to the negative battery terminal, and the second blasting cap lead was connected with the relay. The photocell was to have been attached to the leads marked "sensor." All of the wiring connections were soldered.

This type of fuzing system functions as follows: on exposure to light, the photocell's resistance decreases, causing transistor TR 2 to conduct. When the current from the battery flowing through TR 2 reaches a sufficient level, the relay is activated and its contacts close. This completes the circuit to fire the detonators. The two rheostats were incorporated in the circuit to adjust the sensitivity. The function of transistor TR 1 has not been determined.

In this particular IED, the explosive charge was supposed to have been primed with two electric 1/2 second delay blasting caps and a booster made of detonating cord.

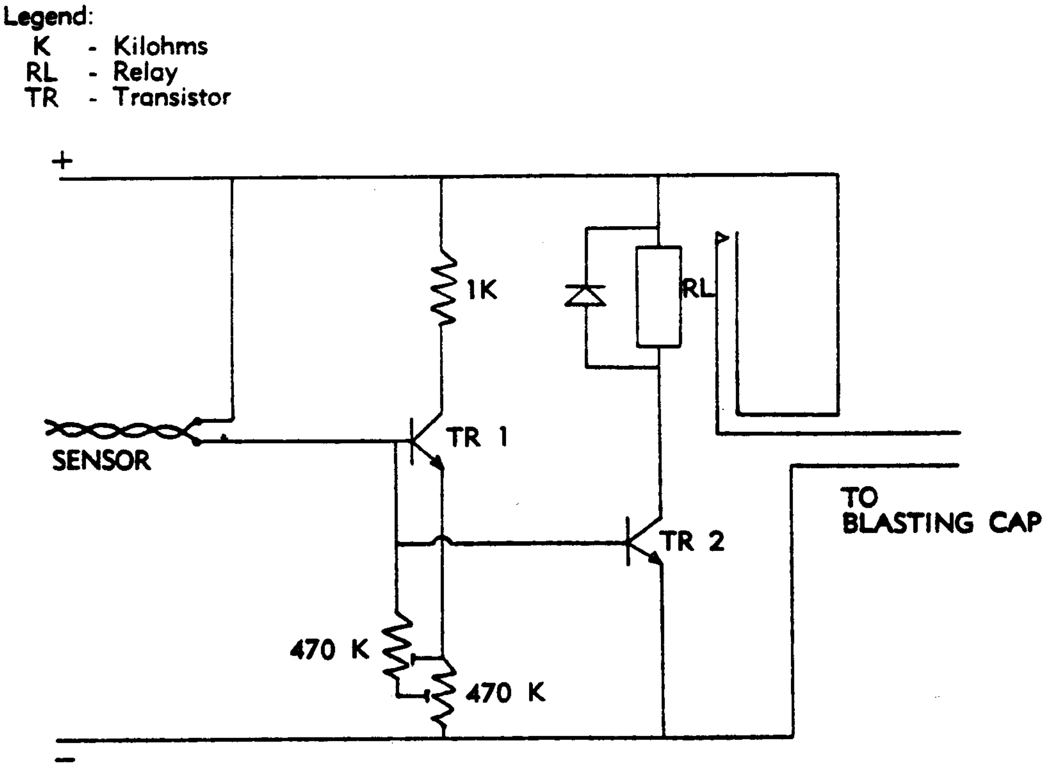


Figure 2. Schematic Diagram of Light Sensitive Device — IED No. 1

## • IED No. 2

This IED (figure 3) consisted of an 11 pound explosive charge, two 2 second delay electric blasting caps, and a photoelectric fuzing system with a delayed arming timer. Two 9 volt batteries served as the power supply. See figure 4.

The fuzing system (figure 5) was contained in a wooden box 6 inches long by 3 inches wide by 1 1/4 inches deep. The box was covered with a crudely cut white plastic lid. Three switches (two black and one red), a test bulb, and a variable resistor were all visible through holes in the lid. At least one of the screws securing the switches was marked with red paint. The device was designed to accommodate a photocell. In use, the bomber would set the desired sensitivity of the photocell by observing the test bulb and adjusting the variable resistor. The device would be tested and the power source disconnected prior to assembly with the explosive charge. After assembly, it would not be safe to arm the firing circuit unless the bomber were working in the dark or a delayed arming device had been intro-

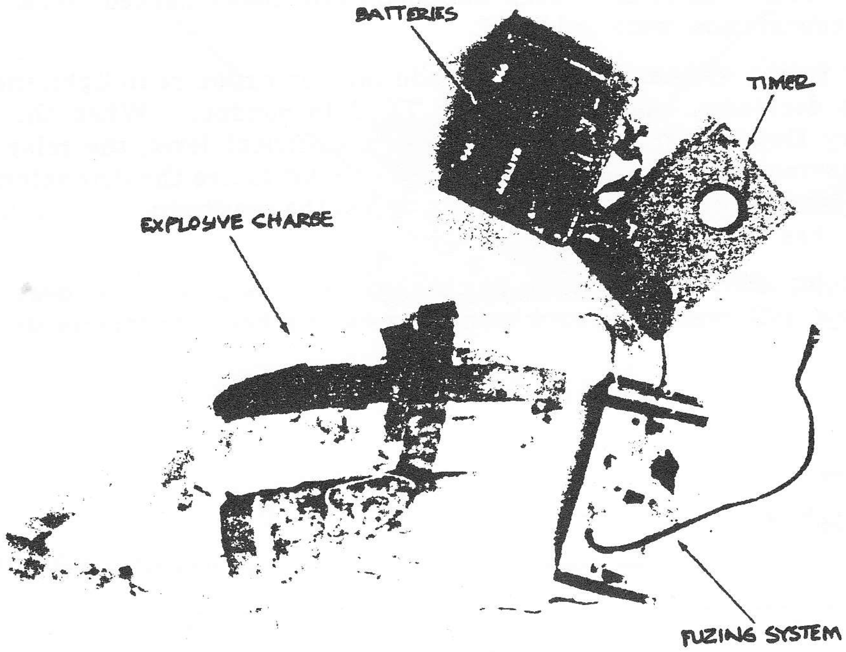


Figure 3. IED No. 2

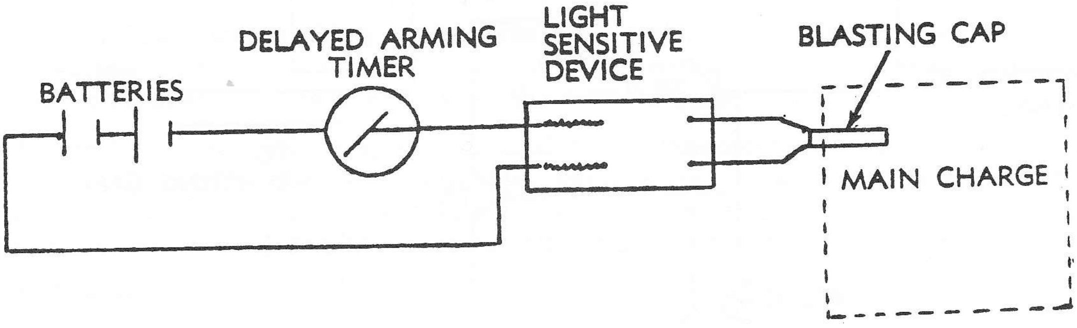
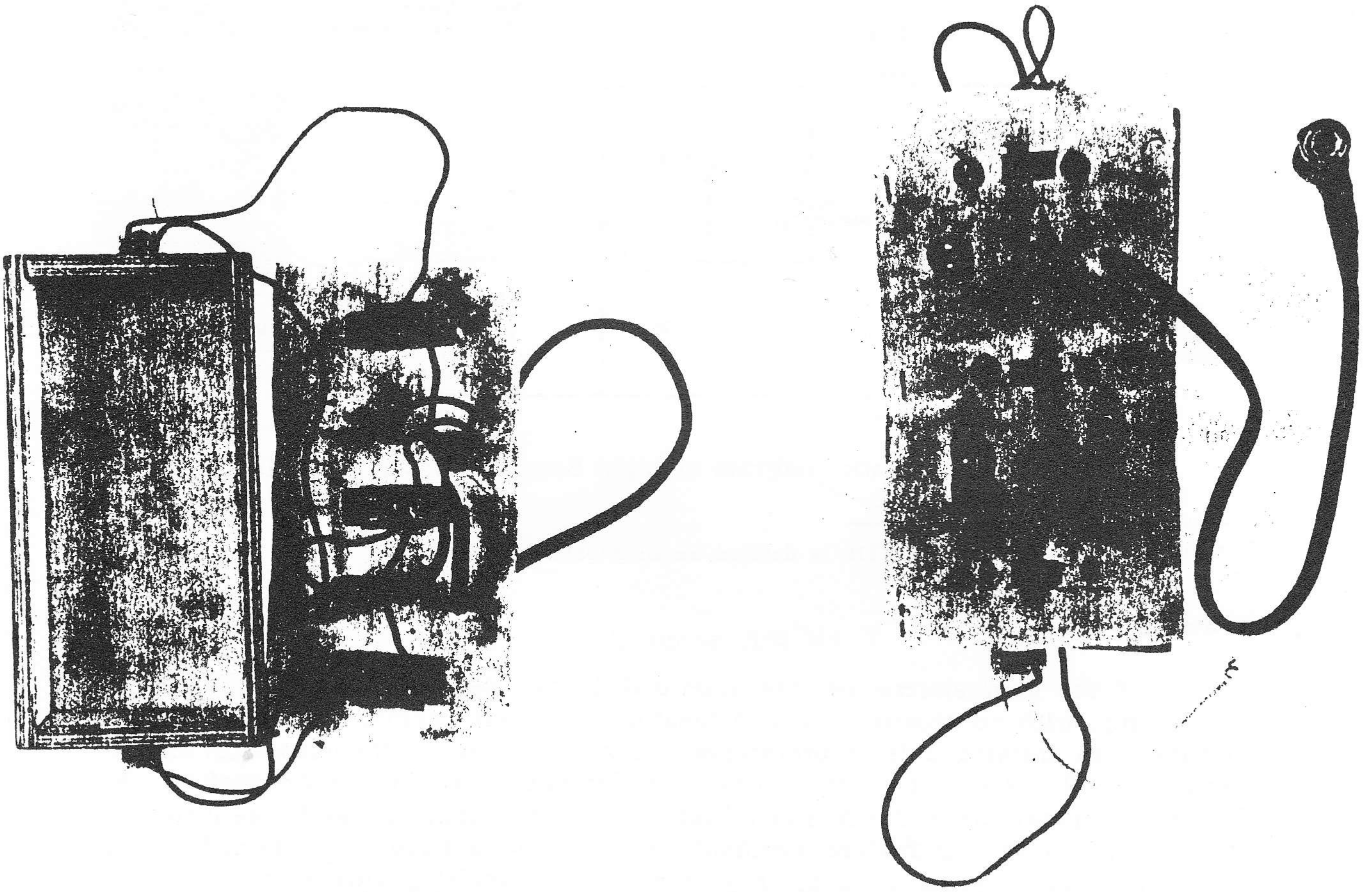


Figure 4. Schematic Diagram — IED No. 2


TOP REMOVED

ASSEMBLED

Figure 5. Fuzing System — IED No. 2

duced into the circuit. Testing and assembly of the delayed arming IED by the bomber would be accomplished in the following order:

- Close switches 2 and 3. Bulb should light.
- Open switches 2 and 3. Disconnect power source.
- Connect power source to delayed arming device which, in turn, is connected to light sensitive device.
- Connect detonator to light sensitive device and insert into main charge.
- Set delayed arming device, thereby breaking the circuit.
- Close switches 1 and 3; switch 2 is optional.

When the timer completes its cycle, it connects the batteries with the fuzing system and the IED is armed. Subsequently, when the photocell is exposed to light, its resistance decreases and the positive voltage on the gate* of the silicon controlled rectifier (SCR) increases. The SCR then switches from OFF to ON, supplying electric power to the blasting cap. See figure 6.

Like IED No. 1, the rheostat adjusts the sensitivity of the fuzing system. If the sensitivity (or resistance) is decreased too much, the SCR will switch and the detonator will fire even if the photocell is not exposed to light.

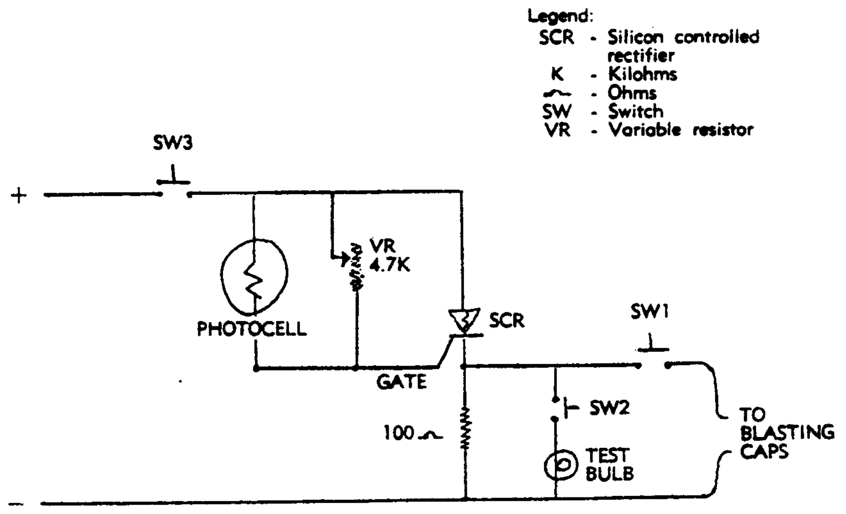


Figure 6. Schematic Diagram of Light Sensitive Device — IED No. 2

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* The gate, as used in this STB, is defined as an internal switch.

## Training Aids

Both of the photoelectric devices described below were constructed to operate a bulb only, with no provision for a detonator. For this reason, they are believed to have been training aids or prototypes of fuzing systems for the purpose of experimentation. Replacement of the bulbs with detonators would convert both of the devices to operationally functional initiators. The fact that neither device incorporated a delayed arming feature (without which it would have to be armed in the dark) is further indication that they were used as training aids only.

Training aid No. 1 (figure 7) is less sophisticated in design than training aid No. 2. Its circuitry, shown in figure 8, is designed to function as follows: on exposure to light, the photoelectric component's resistance decreases, causing the transistor to switch from OFF to ON. This permits current to flow from the batteries through the transistor to the test bulb. If the device is operable the test bulb will light or, in an actual IED equipped with a detonator instead of a test bulb, the detonator will fire.

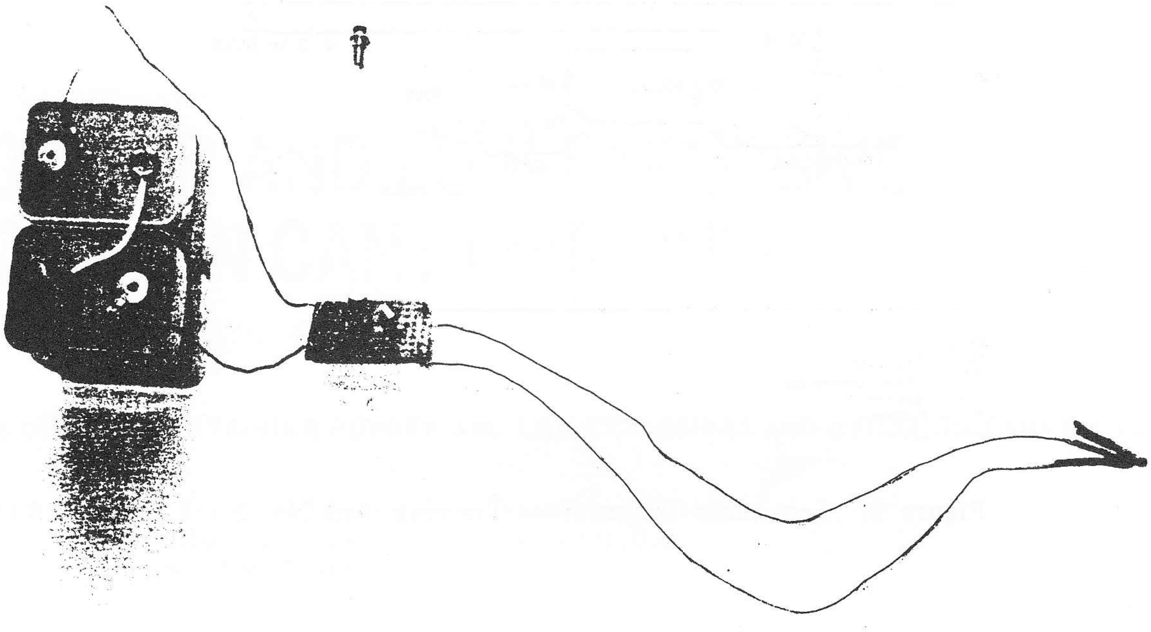


Figure 7. Training Aid No. 1

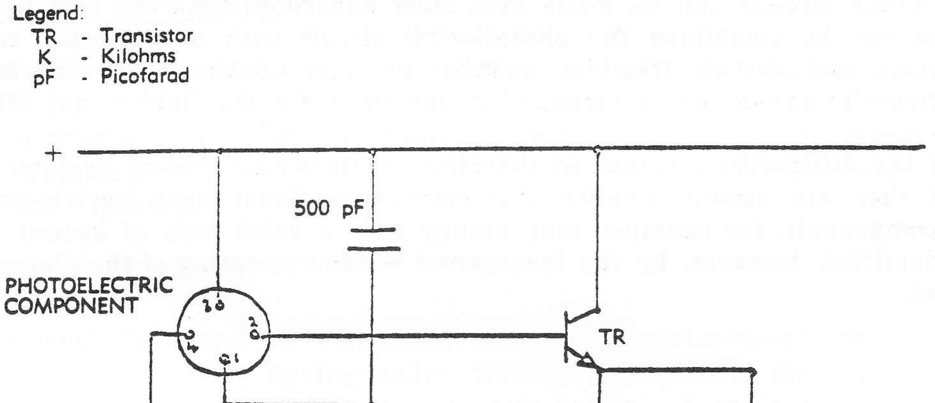


Figure 8. Schematic Diagram — Training Aid No. 1

The more complicated circuitry in training aid No. 2, shown in figure 9, is designed to function as follows: on exposure to light, the photocell's resistance decreases. This causes TR 1 and TR 2 to switch from OFF to ON, in turn, permitting current to flow through the 2.7k resistor and a positive voltage to appear on the gate of the SCR. The SCR then switches from OFF to ON, connecting the bulb with the battery and firing the bulb.

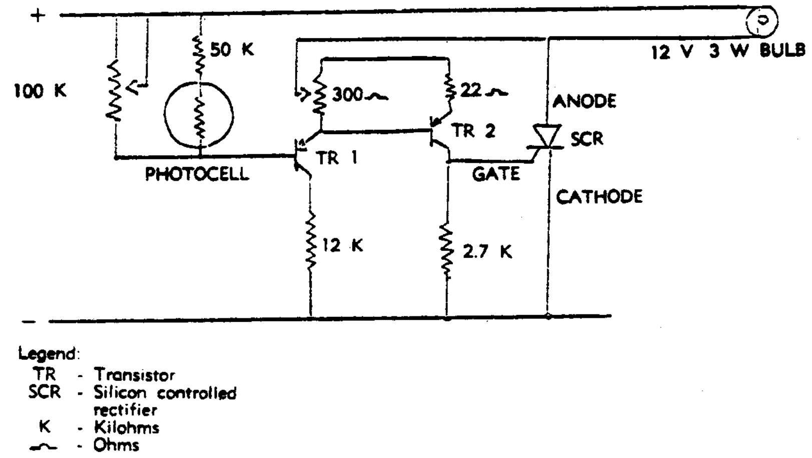


Figure 9. Schematic Diagram — Training Aid No. 2

## COMMENT

The components required to construct a photoelectric fuzing system are readily obtainable from many electronic supply stores. Bomb technicians should be alert to the possibility of encountering IED with this type of fuzing.

Photoelectric circuits can be made even more hazardous than the ones described in this bulletin by combining the photoelectric circuit with a collapsing relay or timer circuit and adding trembler switches or other antidisturbance devices. A photoelectric circuit can also be arranged to operate when the light is cut off.

One of the difficulties involved in detecting photoelectric fuzing systems is the fact that they are usually smaller than more conventional fuzes (certain combinations of components, for example, may occupy only a cubic inch of space). They can be identified, however, by the transparent window or casing of the photoelectric component.

# POWDER AND LOW-EXPLOSIVE BOMBS IN CANS OR TUBES

## BOMB DEVICES CONTAINING POWDER AND LOW EXPLOSIVES AND UTILIZING CANS OR TUBES

**SOURCE:** **Federal Bureau of Investigation, Laboratory Division.**
**Metropolitan Police Department, Washington, D.C.**
**U.S. Army, Fort Devens, Massachusetts.**

Several bombing incidents, allied in their use of improvised explosive devices (IED) containing powders or low explosives and including tubes or cans among the components, have recently been reported to the FBI Bomb Data Center (BDC). One of the cases, all of which occurred in and took place in a South American nation; the others, in the eastern United States. They are recounted in this bulletin in chronological order.

### Pipe Bomb Containing Black Powder

This IED was described as follows: the main charge of black powder was enclosed in a length of PVC pipe. An initiator was placed in the center of this pipe. This initiator consisted of a length of smaller PVC pipe containing the following components in this order: cork, plastic bag of acid, hollowed length of candle, copper plug, match heads, and cotton. See Figure 1.

The initiator was designed to function, after a predetermined delay caused by a chemical action. The acid, having eaten through the plastic and copper plug, would come into contact with and ignite the match heads. This flame, amplified by the paraffin and cotton, would explode the pipe containing the tightly confined powder.

The report of this pipe bomb did not include any information concerning the circumstances of its use. However, the detailed description of the IED which was tendered indicates that it was recovered prior to detonation.

### Aerosol Can Bomb Recovery

A foreign embassy in Washington, D.C. was the target of an attempted bombing during a spring night in An embassy employee discovered a mysterious package near the building's front entrance. The IED contained in this parcel was subsequently disassembled by police and military disposal units. Components of the item were examined by personnel of the FBI Laboratory Division.

The IED consisted of a 25 ounce aerosol can; a 6 volt battery; a cigarette lighter for an automobile; connective wiring; and a main charge of sodium chlorate, silicon dioxide, and calcium carbonate. Colorless glass fibers were located in the filler material as improvised shrapnel. This material was inserted through a hole cut in the bottom of the aerosol can. After filling, the removed portion of the can was then replaced and sealed with solder.

The cigarette lighting apparatus was also inserted into the filler area and connected with wire to the bottom of the can. One wire was affixed in place with sealant. See Figure 2. Through a nearby hole in the metal, a second wire from the heating unit was attached to a terminal of the battery. The other terminal was connected to the metal lid of the can; an uninsulated portion of wire encircling it. These connections provide a circuit utilizing the metal can as a connective component. Shortly after completion of this circuit, the confined substance would explode from the heat generated by the cigarette lighting unit. After recovery, tests were made on the IED and it was determined that this ignition process would take approximately 75 seconds.

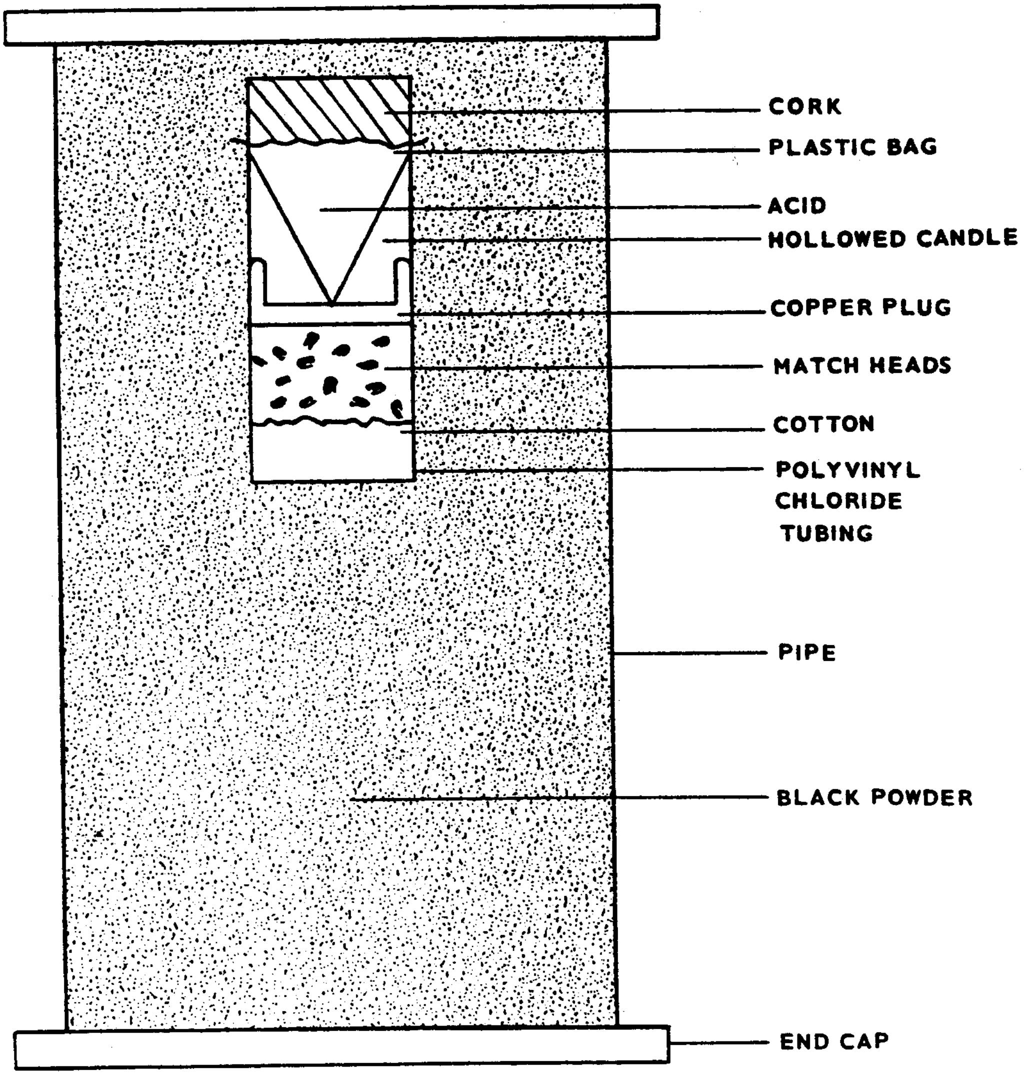


FIGURE 1

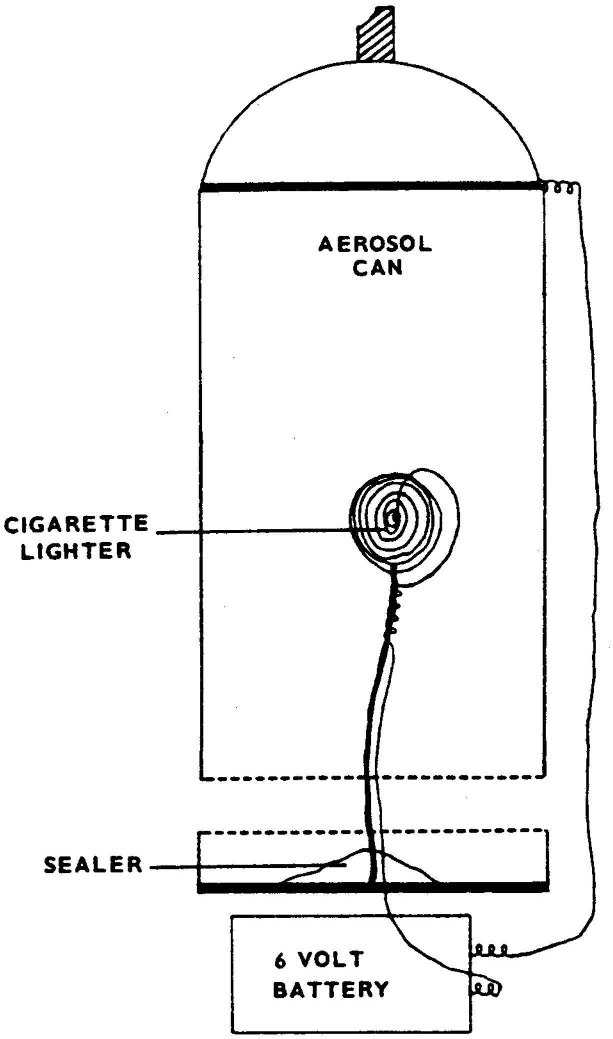


FIGURE 2: AEROSOL CAN BOMB

The investigative personnel involved in this incident have noted that the wiring used in constructing the IED was taped in various places. The torn edges of this tape are suitable for comparisons, should a suspect roll of tape be encountered.

## Postal Bomb Containing Smokeless Powder

During late an IED containing smokeless powder was mailed to the intended victim at his Washington, D.C. place of business. He became suspicious because the package was labeled with a type of marker previously used on threatening letters received by him. The bomb device situated in this box did not explode, and was disassembled by public safety personnel.

The IED, which contained three separate units, consisted of a large manila envelope, a tampon box, three books of matches, three test tubes, three pieces of string, three cardboard wedges, and 4.3 grams of smokeless powder. Three individual apparatus were constructed, using the test tubes as containers, and inserted into the tampon box and manila envelope. Each tube was half-filled with powder and held in place with a cardboard wedge. See Figure 3. The wedge also served to retain one end of a piece of string in position within the powder. Each length of string was, in turn, attached to a match book in the vicinity of the striker strip. Two matches were pulled from behind each match book cover and taped across the striker. The matches of each pack were then apparently taped to the inside of the end flap of the tampon box. The devices appear to have been intended to function when this flap was drawn out, thus causing the matches to pull across the strikers; igniting them and, subsequently, the strings. These improvised wicks would carry the fire to the powder, causing its detonation.

Investigators report that this incident is related to one which occurred almost two years earlier, in which a Washington, D.C. office received a hoax IED.

### Spray Can Bomb Recovery at Hotel

Approximately three weeks after the recovery of the tampon box bomb, a maid in a Washington, D.C. hotel discovered an IED, which had been secreted in a laundry chute closet. The device, which was dismantled in place by public safety technicians, was constructed within an aerosol can and was very similar to that which was recovered at the embassy.

The IED consisted of a 25 ounce aerosol can; two 6 volt lantern batteries; a small wind-up alarm clock; wire; a cigarette lighting element from a vehicle; and an explosive mixture. It was constructed in the following manner. The two batteries, each having screw terminals, were taped together end to end with masking and electrical tapes. One battery terminal from this unit was connected to the wind up key on the back of the clock. The crystal and minute hand had been removed from the clock, and a nail taped to its face at the 12:00 o'clock position. (The minute hand was discovered on the floor near the IED.) At the time of discovery, the hour hand was between the 9:00 o'clock and 10:00 o'clock positions. A wire from the nail was inserted through the bottom of the aerosol can, to be attached to the lighting unit situated outside. Another piece of wire ran from the heating element to the bottom of the can, where it was soldered in place. A wire connected the base of the can and a second battery terminal. A wire connected the batteries. The base of the aerosol can had been cut off and then soldered back in place. The clock was fastened with masking tape to the top of the battery unit, with the can being affixed to the back of this unit. There was no attempt made to conceal the nature of the weapon.

An explosive filler consisting of granulated solidox pellets and a flammable liquid; plus improvised shrapnel such as nails, brads, and BB pellets, was contained in the aerosol can. It was intended to detonate after completion of the circuit through the clock. Heat generated by the lighter would cause initiation of the mixture.

Two days later, another aerosol can bomb was located in a laundry room of the same hotel. It was enclosed in a pillow case and had partially detonated. It was similar in construction and materials to both the previously recovered IED. When found, the device was charred and the top of the can and the cigarette lighter were missing. As in the previous incident, no prior threats were received.

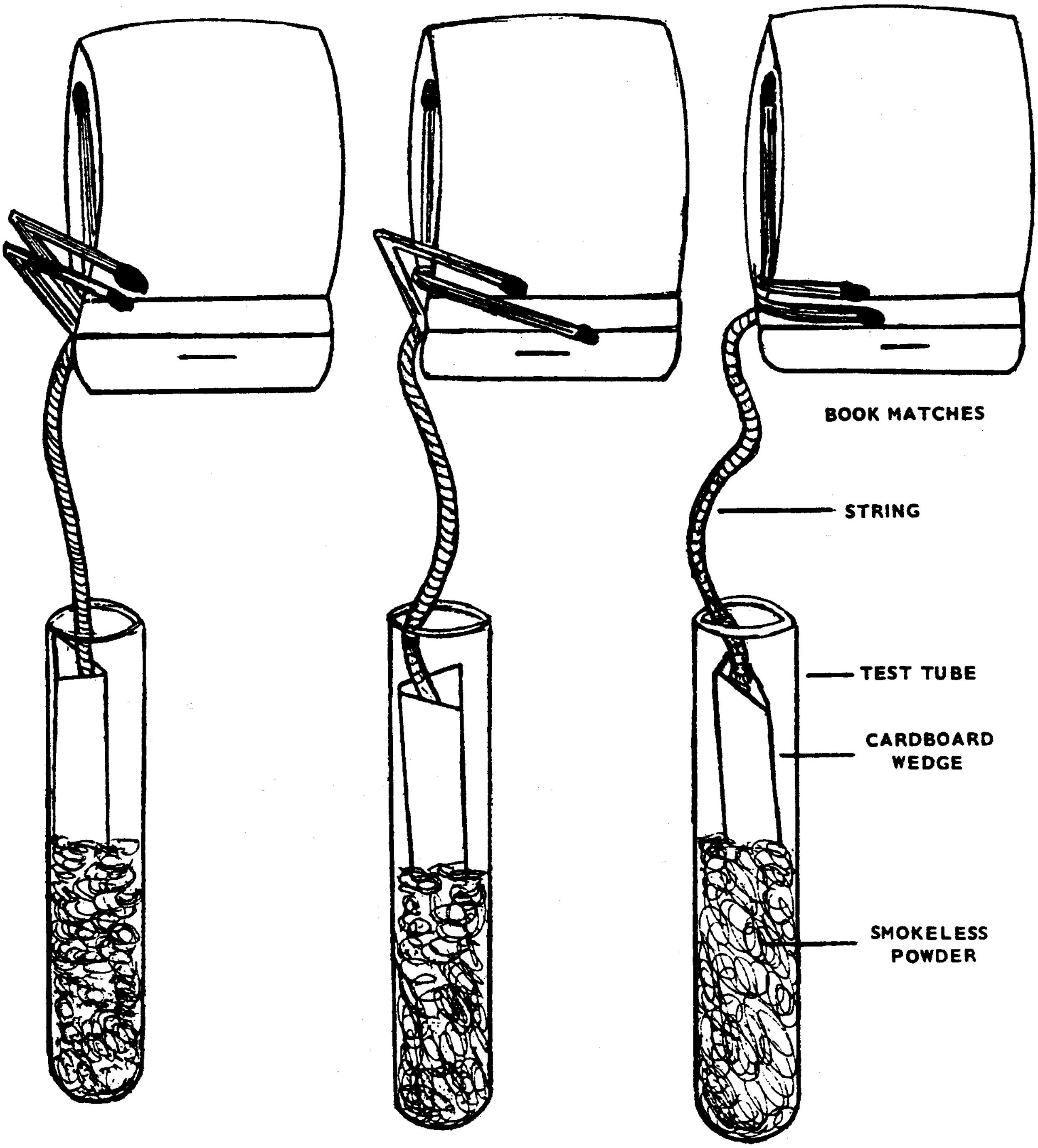


FIGURE 3: INITIATING UNITS FOR POSTAL BOMB

## Black Powder Initiated Bomb Found at Police Station

Military explosive ordnance disposal (EOD) personnel were summoned to complete the disassembly of an IED located during a February, incident. After dismantling, components of the improvised Claymore mine-type IED were returned to the law enforcement personnel.

The device, constructed in a shoe polish can and a plastic box, included two improvised initiators. Each initiator consisted of a quantity of black powder and an electric blasting cap, and was contained in a tube improvised from half a blasting cap shipping package. The ends of each apparatus were sealed with a coin and a portion of chewing gum; the units were wrapped in electrical tape. See Figure 4.

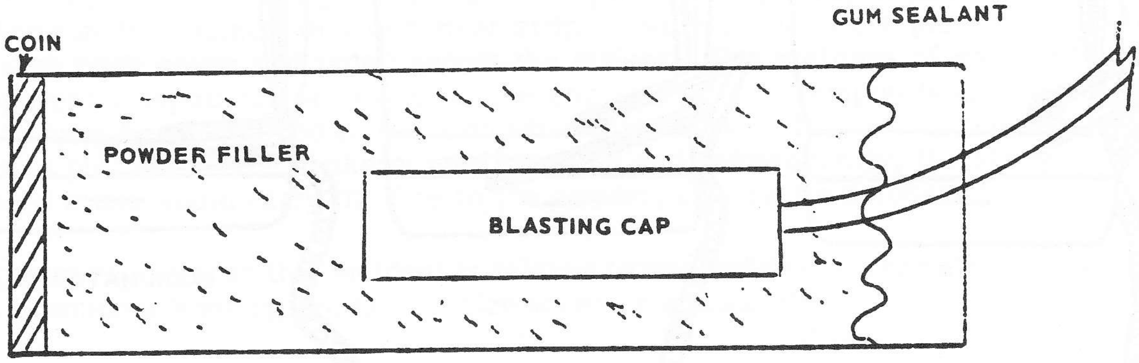


FIGURE 4: INITIATOR FOR POLICE STATION BOMB

The two initiators were wrapped in a shoe polishing cloth and enclosed in the polish can, which had a metal bottom and a plastic top. A plastic box containing .22 caliber long rifle shells was affixed to the polish tin with friction tape. It contained a total of 100 shells of different brands and comprised the main charge of the IED. See Figure 5.

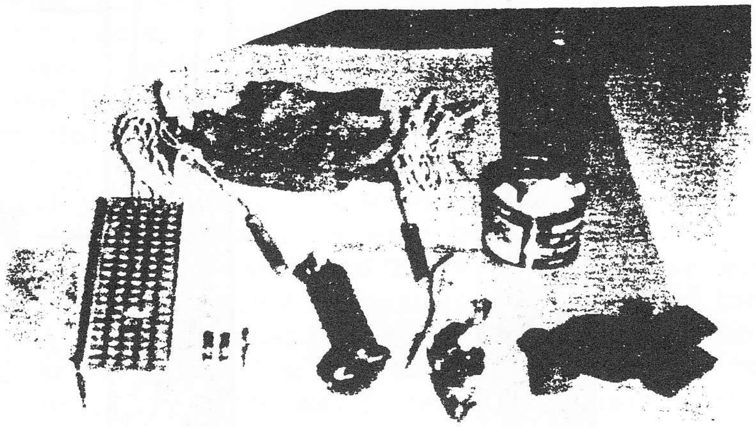


FIGURE 5: COMPONENTS OF POLICE STATION BOMB

The IED, which was taken to a safe area and completely disassembled, was intended to function as an improvised Claymore mine. No threat was received prior to its recovery. At least one suspect has been identified in connection with this crime.

# SAN JUAN AUTOMOBILE BOMBING

1. **Classification:** **Restricted Technical Data.**

2. **Subject:** **San Juan Automobile Bombing.**

3. **Source:** **Police of Puerto Rico.**

4. **Background:** Although Puerto Rican independence is often used as a cause by militant groups for carrying out bombings and other terrorist actions in the United States, bombing incidents occurring in Puerto Rico itself seldom receive news media coverage outside that island. The incident in this bulletin is highly significant and warrants publication because two bomb technicians were seriously injured while handling an improvised explosive device (IED) attached to the underside of a car.

## DETAILS

October 22, 9:30 a.m.: Puerto Rican authorities received a telephone call from an individual who indicated that a possible IED was fastened to the undercarriage of his car. He stated that while walking toward his car, he had noticed a string extending from the bottom of the car to the ground. His suspicions had been further aroused when he stooped down for a closer look and saw a package attached to the vehicle just beneath the driver's seat. Two agents from the explosives and incendiary section were immediately dispatched to investigate the call.

The automobile, a late model Thunderbird, was located in an isolated parking lot a considerable distance from the nearest structures (two apartment buildings). Upon their arrival, the agents approached the target vehicle and made a visual inspection which verified the information related by the victim. Once they had determined that the suspect package fastened to the bottom of the vehicle was probably an explosive device, the officers requested that an explosives van respond to the scene. They then attempted to neutralize the IED, so that when the van arrived, the bomb could be removed to a safe location. During this process, the device detonated and severely injured the agents. The intended victim was also injuried, but less seriously. The vehicle was destroyed in the explosion and subsequent fire. See Figures 1 and 2.

One officer lost both hands above the wrist and the hearing in one ear; and suffered substantial loss of sight in one eye. The other lost his right arm above the elbow, his left hand, one eye and possibly the other, and a substantial amount of hearing in both ears. Both men were burned on their chests and faces. The intended victim was burned on one leg, and was struck in the chest and face by fragments.

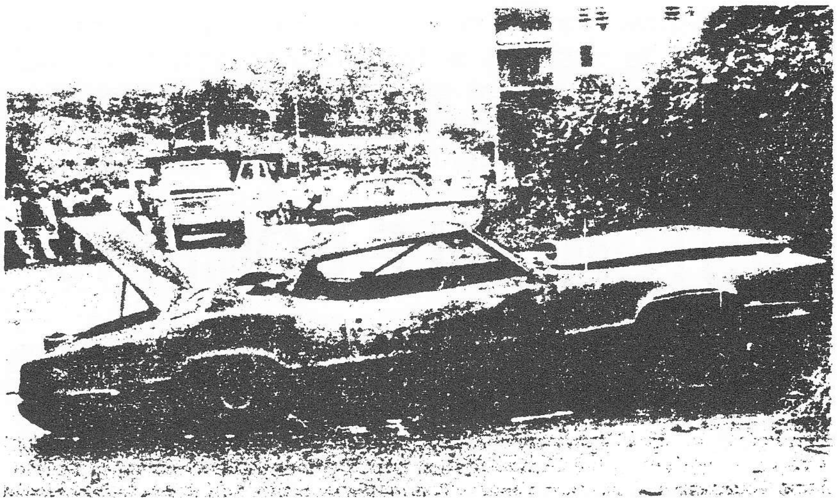


FIGURE 1: VIEW OF CAR FOLLOWING EXPLOSION

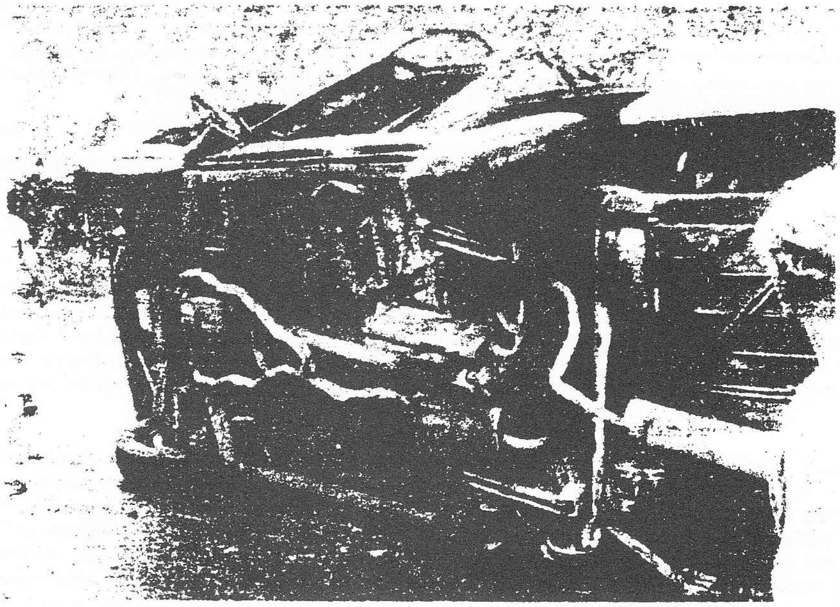


FIGURE 2: UNDERSIDE OF VEHICLE SHOWING LOCATION OF BOMB

## TECHNICAL INFORMATION

In some respects it almost seems as though circumstances surrounding this incident conspired to deprive authorities of any evidence. Following the detonation of a powerful explosive, the process of extracting evidence from the debris is difficult at best. In this case, however, difficulties encountered in the investigation of the explosion were compounded by two additional occurrences—a fire, and subsequent efforts to extinguish it. As a result, no traces of the explosive charge were found.

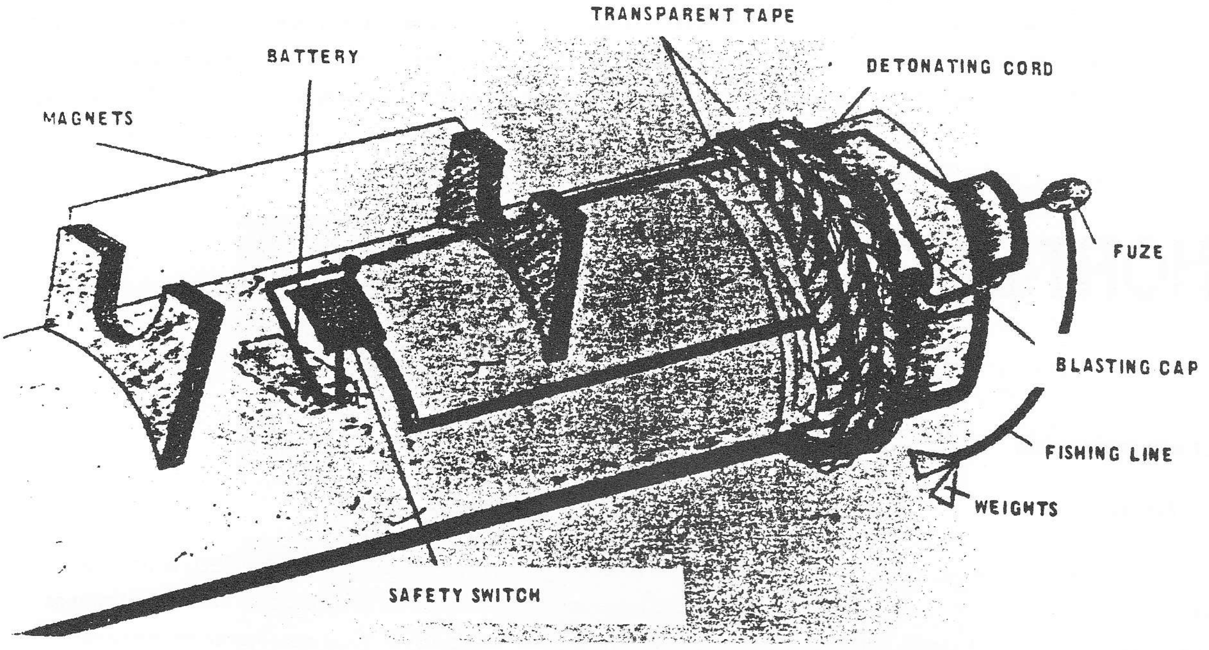


**FIGURE 3: ARTIST'S CONCEPTION OF EXPLOSIVE DEVICE.**

One of the injured agents was able to describe what he had seen of the IED before it detonated. The exact appearance of the container, or for that matter, the determination whether there actually was a container has not been ascertained with certainty. Therefore, the cylindrical object in Figure 3 is strictly a representation used to provide a general idea of the IED's overall dimensions and to give the viewer an indication of where the various components were located. Measuring approximately 2 inches by 10 inches, the device was wrapped in paper tape. Magnets were used to anchor it to the bottom of the car, and the fuzing system was apparently intended to function by either pressure release or a push/pull action. Once the car was in motion, the weights attached to the fishing line may have been intended to bounce or drag along the surface of the road, causing the device to function. Although the exact cause of detonation has not been determined, it is possible that the fishing line attached to the fuze mechanism was tugged during the technicians' attempts to neutralize the bomb.

### COMMENT

Both bomb technicians had attended numerous seminars on explosives sponsored by the International Association of Chiefs of Police, the U.S. Army and Navy, the Secret Service, and the Police of Puerto Rico. In addition, one of the officers had received explosives training at Redstone Arsenal, Alabama.

During two bomb technicians were killed, with six being seriously and permanently injured. Regardless of early conclusions as to the reason for such tragedies, it must be remembered that for every terrorist or criminal mentality there may be a different type of explosive device encountered. There is no way to determine an absolutely safe procedure for disarming a particular explosive device; no way to know exactly what type of booby trap may have been incorporated into the design; no way to tell when a delay mechanism may cause the IED to function. This underscores the necessity for every bomb technician to maintain a high level of proficiency and to take into account the wide range of possible devices whenever he is called upon to deal with a suspect item.

# SHORT-DURATION TIMER

**SHORT DURATION TIMER**

**Source: Foreign.**

The use of a clockwork mechanism to regulate the detonation of an improvised explosive device (IED) is not unknown in the annals of bomb construction. Watches, alarm clocks, and timers provide a reliable, convenient means of causing an explosion. The very efficiency of the typical timing arm and contact point configuration, however, seems to preclude experimentation with other refinements. The incident described in this bulletin involves a timer to which an additional component has been added to the usual mechanism. During January two improvised timers and battery units were recovered by foreign law enforcement personnel after a terrorist incident. Examination of the items revealed that each of the timers had been modified to permit an extremely short interval between the final arming and completion of any circuit to which it was connected.

**Clockwork Mechanism with Rod**

Each of the devices recovered consisted of a 60 minute pocket alarm timer mounted on an improvised timer and power unit box. A nail was attached to the movable dial as one contact; a fixed nail provided the second contact. This standard construction was modified with the emplacement of a wooden dowel near the fixed contact post. See Figure. The rod, to which was attached a loop for easier removal, was inserted in such a way that the moving contact would come to rest against it before completing the contact. Upon removal of the dowel, therefore, the timer dial would continue revolving for the short distance necessary to effect contact and complete the circuit. When these items were tested, it was determined that a time lapse of approximately two minutes ensued between removal of the doweling and contact.

The originating agency has offered the following comments concerning the dangers of an item such as this if used in an IED.

"The much reduced delay times resulting from the use of this new breed of timer will make the movement of devices by well-meaning but foolhardy persons risky."

"It is possible that some timers having been held for some time by the dowel rod may 'spring' forward when the dowel is removed, causing the circuit to be completed immediately."

"With other timers, it is possible that once the action has been stopped two minutes from the completion of its unwinding, the mechanism may be too weak to start again, and the terrorist is faced with the task of shaking the timer with the contacts already quite close together."

"Should a two-minute timer fail to restart when the dowel is removed by the terrorist, there is a risk that subsequent disturbance of the device, either through handling or through the use of remote equipment (e.g. hook and line), may cause the timer to restart, and to explode two minutes later, possibly as a unwary operator or investigator approaches."

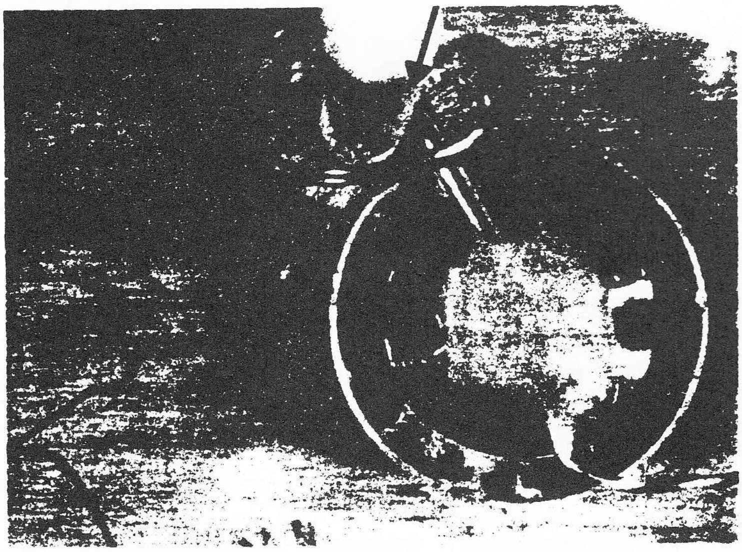


FIGURE: TIMER WITH DOWEL IN POSITION. ARROW INDICATES POSITION OF DOWEL

# SOLID-STATE TIMING DEVICE

1. **Classification: Restricted Technical Data.**

2. **Subject: Solid State Timing Device.**

3. **Source: National Bomb Data Center (NBDC), Picatinny Arsenal, Dover, New Jersey.**

4. **Background:** The Compuline Corporation of Norristown, Pennsylvania, manufactures a small solid state timing device for use in the automotive sales and service industry as a service reminder. Sold under the trade name of Car-Comp, the device (figure 1) is about half the size of a cigarette package and is used to measure engine operating hours. It is available from many automobile dealers throughout the country.

Replaceable time capsules in the device provide for operating cycles of 10 to 200 hours, as desired. All the time capsules are identical. The various operating cycles (time periods) are derived from minor component value differences incorporated into the circuit. When an operating cycle has been completed, a visual signal indicates to the vehicle operator that a service interval has been reached.

Since this device is small, readily available, uses a DC power supply, and performs a timing or measuring function, it could be used as a timer in an IED. Although such use has not been reported to date, participants have expressed an interest in this item. Consequently, the NBDC has evaluated it for its potential use in IED and to determine appropriate countermeasures. The purpose of this bulletin is to disseminate the information derived from that evaluation.

## TECHNICAL INFORMATION

The device is designed to be placed in the automobile's electrical system by connecting its red lead to the fuse in the ignition circuit and its black lead to ground. Thus connected, the unit will operate whenever the ignition switch is turned on.

Following is a general description, taken largely from the manufacturer's literature, of the operation of the Car-Comp device. Figure 2 shows the unit's printed circuit board, with the timing capsule installed, and with it removed. Figure 3 shows the component side of the printed circuit board. Figure 4 shows a schematic diagram of the device.

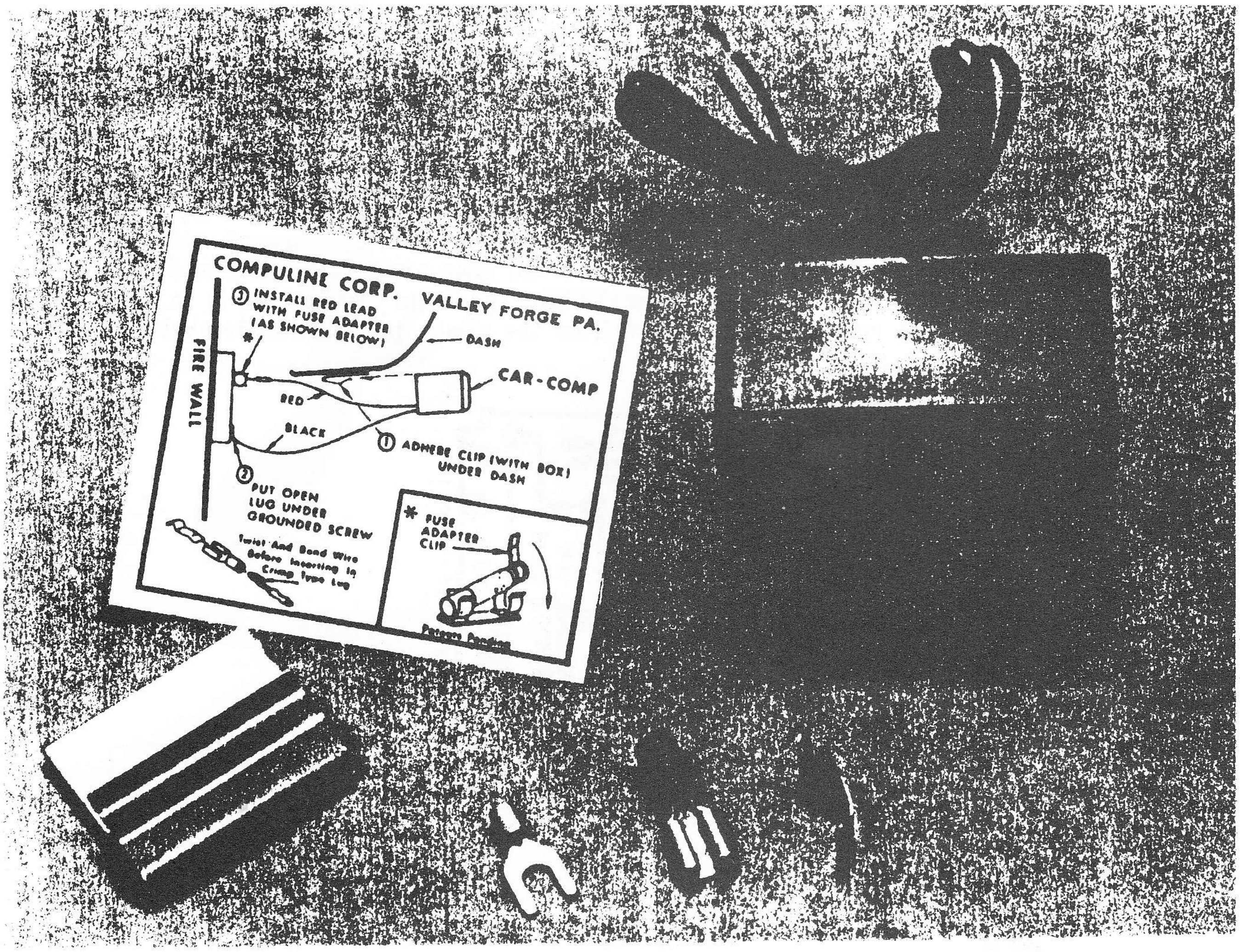

COMPULINE CORP.
VALLEY FORGE PA.
③ INSTALL RED LEAD WITH FUSE ADAPTER (AS SHOWN BELOW)
*
DASH
CAR-COMP
FIRE WALL
RED
BLACK
① ADHERE CLIP (WITH BOX) UNDER DASH
② PUT OPEN LUG UNDER GROUNDED SCREW
Twist And Bend Wire Before Inserting In Crimp Type Lug
* FUSE ADAPTER CLIP
Patent Pending

**Figure 1. Car-Comp Device**

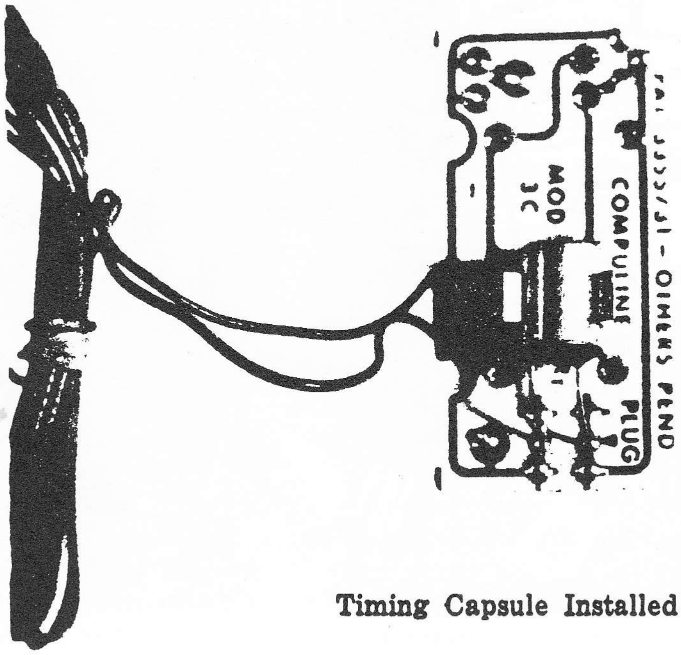
The Compuline timing capsule is an inexpensive, three contact electrochemical cell which can be utilized in very simplified circuitry to measure long time periods, and provide a "switch opening" at the end of a calibrated time period. The capsule or cell operates by the timing out (plating away) of a specific volume of metal at a controlled rate, and derives its accuracy from the ion transfer of metal atoms that are being timed out. Plating current is supplied through a series calibrating resistor ($R_C$, figure 4) to the outer shell of the capsule, which is the cathode in the timing out operation. Two insulated leads, which are connected or "shorted" by the precision volume of metal, constitute the anode of the plating circuit. These two leads, which are normally closed (as in a "switch"), will open after the calibrated number of operating hours to provide a "switch opening."

Since the "preset charge" or volume of metal is identical on all capsules, the time duration (5 to 5000 hours is technically possible) is determined by the value of calibrating resistor $R_C$, figure 4.

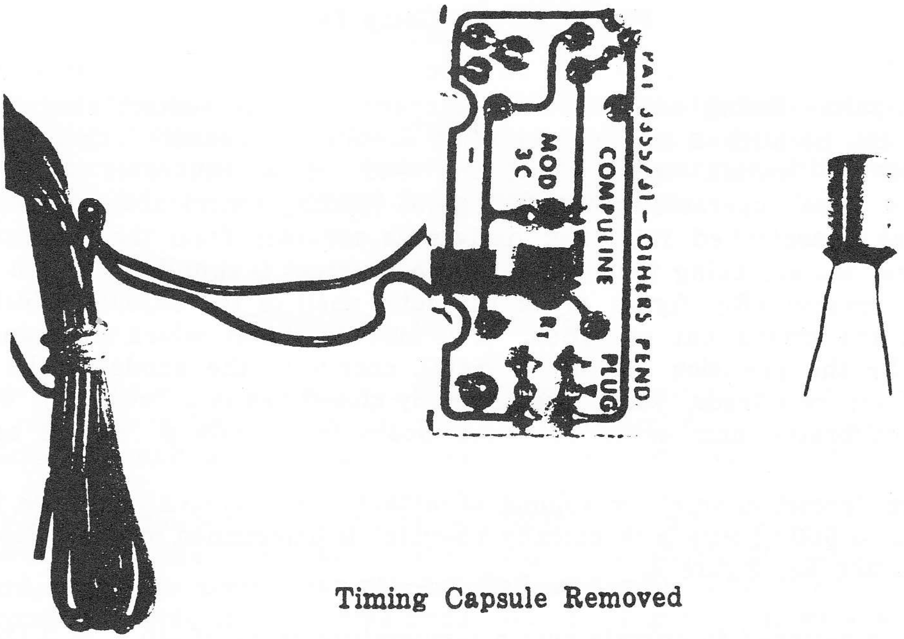
The unit is designed to operate over a temperature range of -40°F to +180°F and to withstand thermal shock between these two temperature extremes.

The "switch opening" effect (the plating away of the anode until it breaks the electrical circuit) allows the capsule to control large amounts of current through a single stage amplifier, and is of low enough impedance to be unaffected by electrical "noise" (outside electrical interference) in hostile environments.

Figure 4 shows a basic, one transistor amplifier which incorporates the capsule as a time-out (plating) and "memory" element. The single transistor amplifier ($T_1$), is normally conducting by the application of input current through resistor $R_1$. When a new capsule is connected between the base of the transistor and the emitter, the anode bar connects the base to the emitter while the capsule is in the time-out period. The rate of current flow from the anode to the cathode shell of



Timing Capsule Installed



Timing Capsule Removed

Figure 2. Car-Comp Printed Circuit Board

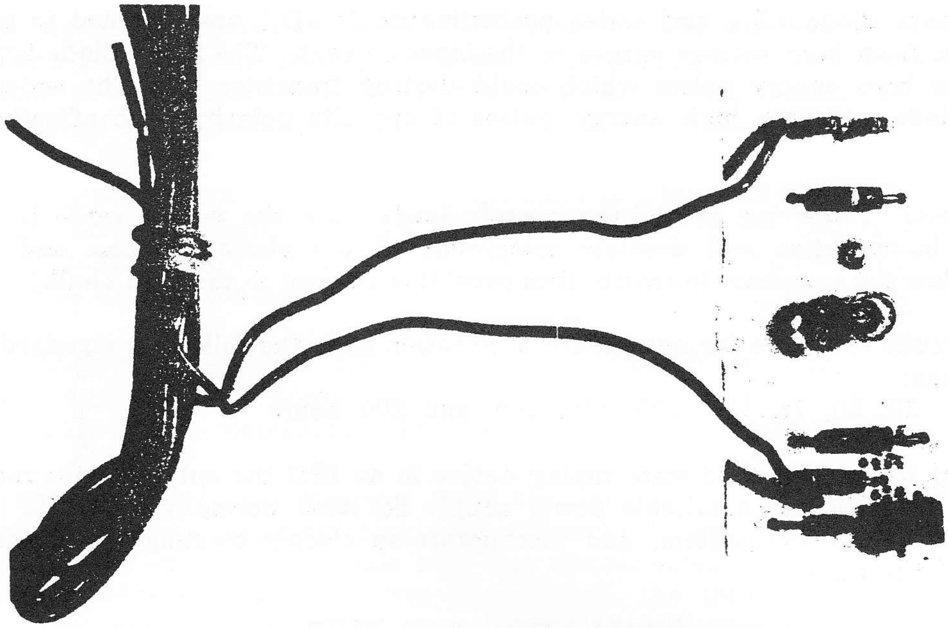


Figure 3. Component Side of Printed Circuit Board

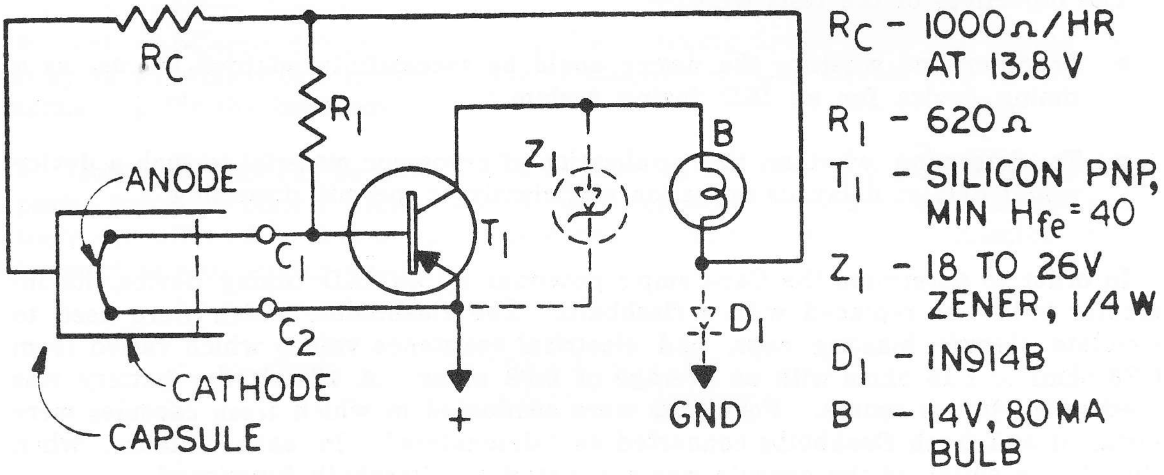


Figure 4. Schematic Diagram

the can is determined by the calibrating resistor ($R_C$) which, in an average 13.8-volt automotive alternator circuit, is approximately 13.8 milliamperes of time-out current.

The time-out or plating period may be intermittent. When the anode has been sufficiently plated away to break continuity between leads $C_1$ and $C_2$, the electrical "short" between the base and emitter of the transistor is removed and the effective resistance between the base and the emitter switches from zero to a minimum of 150 ohms. The gain of the transistor is chosen to be sufficiently high to provide the desired collector current through the load (bulb), with the selected input current, which is supplied through resistor $R_1$.

The Zener diode ($Z_1$) and series protective diode ($D_1$) are designed to protect the circuit from high voltage surges in the input current. The Zener diode bypasses extraneous high energy pulses which could destroy transistor $T_1$. The series protective diode prevents high energy pulses of opposite polarity from affecting the circuit.

> **Note: Removing one of the capsule leads from the circuit while it is in operation will simulate completion of the plating process and allow the transistor to switch, thus providing current to the load (bulb).**

The circuits available for automotive application have the following standard time-out settings:

10, 50, 75, 100, 120, 150, 180, and 200 hours

In order to use this solid state timing device in an IED the only changes required would be to substitute a suitable power supply for that normally available in the automobile's electrical system, and incorporate an electric blasting cap as the load instead of the bulb.

## EVALUATION AND TEST

The NBDC performed several tests on the Car-Comp device to determine its effectiveness in an IED application, and to evaluate a means of neutralization.

The objectives of the tests were:

- To determine whether the device could be successfully adapted for use as a timing device for an IED fuzing system.
- To determine whether the application of cryogenic material to such a device would halt or delay its operation sufficiently to permit disarming.

In order to determine the Car-Comp's potential as an IED timing device, its indicator bulb was replaced with a flashbulb. The flashbulbs, which were used to simulate electric blasting caps, had electrical resistance values which varied from 0.76 ohms to 1.16 ohms with an average of 0.98 ohms. A 12-volt dry battery was used as the power source. Four tests were conducted in which fresh capsules were installed and fresh flashbulbs connected as "detonators." In each instance, when the plating action of the capsule was completed the flashbulb functioned.

In addition, several tests were conducted in which a fresh capsule and flashbulb were placed in an operating Car-Comp circuit. When one of the leads of the capsule was disconnected from the circuit, the action simulated the completion of the timing-out operation and caused the flashbulb to function.

As a check, several tests were conducted using electric blasting cap bridge wires in lieu of flashbulbs. When the timing-out operation was completed, or when a capsule lead was removed from the circuit, the bridge wires flared.

In the evaluation of cryogenic effects, four Car-Comp devices were prepared with fresh capsules and flashbulbs as in previous tests. Two devices were suspended above a bath of liquid nitrogen and exposed to the cold nitrogen gas; two were submerged directly in the liquid nitrogen. In these tests the flashbulb and battery were remotely located and remained at room temperature. Current measurements were made at two points on the device as follows: The plating current was measured at the cathode of the capsule (figure 4); the input current was measured at the positive terminal of the battery.

In the suspension tests, the plating current decreased from 1.3 milliamperes to 0.15 milliamperes after 10 minutes exposure. Continued exposure resulted in no further decrease in plating current. Input current did not undergo a significant change and the flashbulbs did not function.

In the submersion tests, the plating current immediately dropped from 1.3 milliamperes to approximately zero (below any measureable value). The input current decreased 25% before stabilizing. The flashbulbs did not function.

Upon completion of the cryogenic tests, the devices were allowed to warm up to room temperature. After reaching room temperature, and upon recovery of the input and plating currents, a capsule lead was disconnected from each device. In each instance, when a capsule lead was disconnected, the transistor passed enough current to the flashbulb to cause it to ignite. This is analogous to a collapsing circuit when a holding battery is disconnected from its relay.

## CONCLUSIONS

- The Car-Comp device may be used as a timing device in an IED fuzing system by substituting a dry battery for the automotive ignition circuit and an electric blasting cap for the indicator bulb.

- Liquid nitrogen can be used to slow or temporarily stop the plating action in the capsule; however, normal plating action can be expected to resume if the device and battery are allowed to warm up. The capsule should **never** be disconnected from the circuit as a disarming procedure.

# TILT-OPERATED DISGUISED DEVICE

## TILT OPERATED DISGUISED DEVICE

**Source: Foreign.**

Following a robbery at a post office branch, an improvised explosive device (IED) was left behind by the perpetrator. After placing the device on a shelf, the robber gave his victims a three minute warning and fled from the scene.

The responding explosive ordnance (EOD) technician found the IED to be a cylindrical-shaped package which had been elevated at one end by resting it on a box of tea bags. Protruding from the elevated end of the cylinder was a length of burnt safety fuse which gave the initial impression that an unsuccessful attempt had been made to initiate the device. Once disarmed, however, closer examination of the package revealed that it housed a tilt operated, booby-trapped explosive device—the outer container had merely served as a decoy.

The outer container was a length of orange-colored plastic pipe measuring 12 inches long by 5 inches in diameter. Near one end was a hole where the safety fuse could be inserted. Black plastic tape had been wrapped around the entire pipe. Inside this larger pipe were the explosive charge and a smaller plastic pipe that contained the initiating system. See Figure 1.

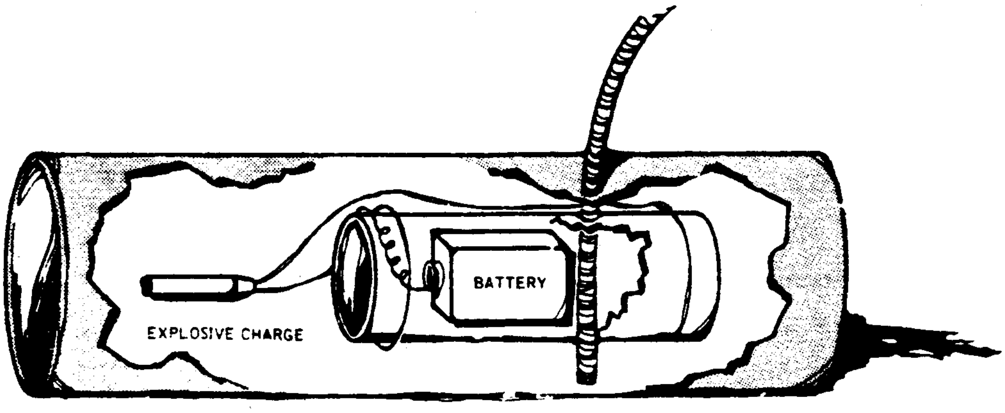


FIGURE I

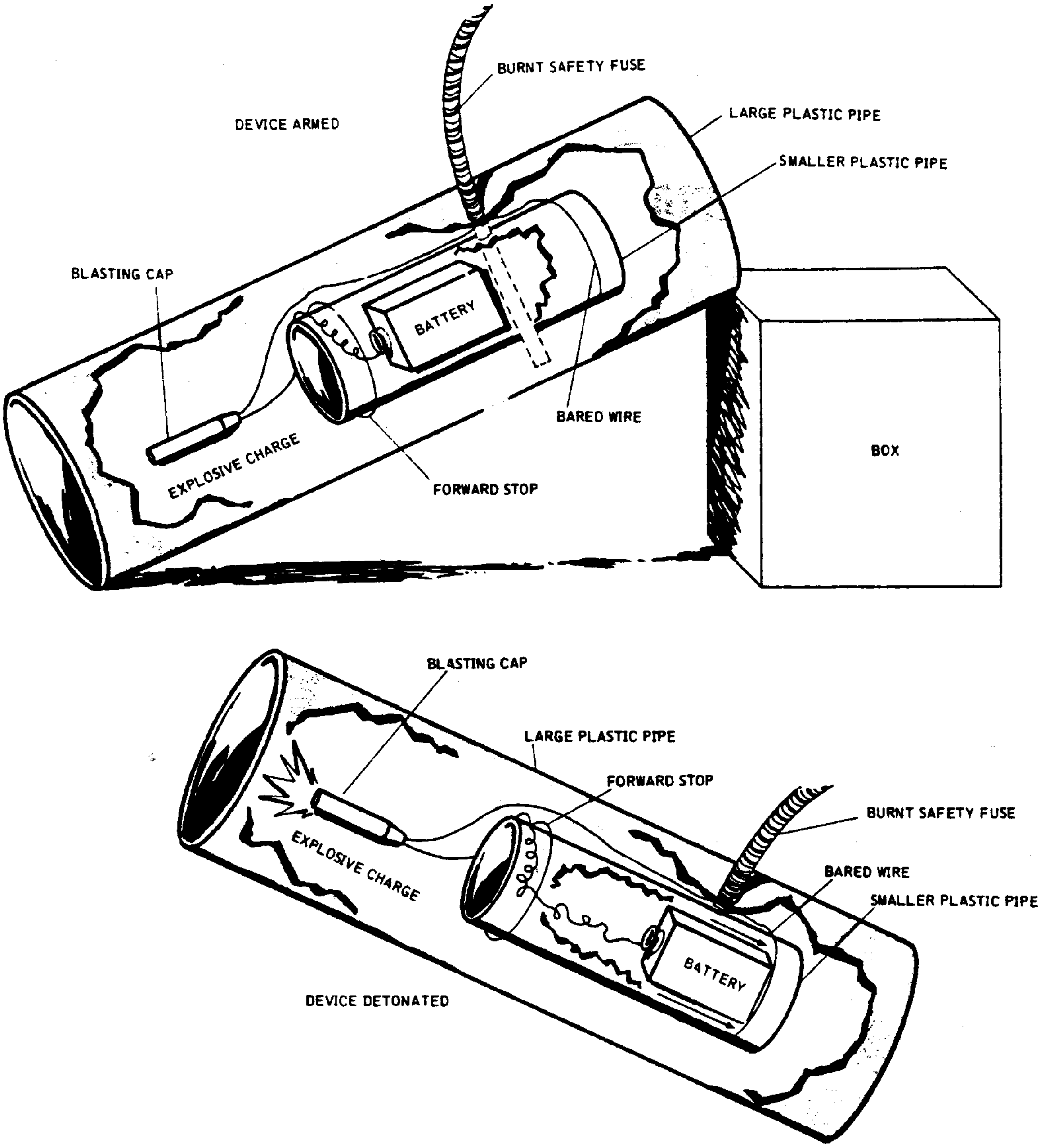


**FIGURE I CONT**

Dimensions of the inner pipe were 6 inches long by 1.6 inches in diameter. Two holes—at diametrically opposed positions—had been made near one end to correspond with the single hole in the larger pipe. Inside this smaller pipe were an Eveready SP2 battery (the equivalent of a "D" cell battery), a forward stop to prevent the battery from sliding too far forward, and a bared length of copper wire that served as a contact. Paper wadding was used to hold the smaller pipe in place at one end of the larger pipe.

Three to four pounds of commercial explosives were placed at the other end of the outer pipe. The initiator was a number six electric blasting cap (ebc). One ebc leg wire was attached to the positive terminal of the battery; the other was connected to the copper wire running across the end of the inner pipe. The length of burnt safety fuse was passed through the holes in the two pipes to prevent the battery and the bared copper wire from making contact prematurely.

The IED was positioned on the box of tea bags so that the end with the safety fuse was elevated. To arm the explosive device, the safety fuse was partially withdrawn until it cleared the smaller pipe. while remaining inside the larger pipe. If the device was carelessly or unwittingly tilted into the opposite plane, the battery would slide into contact with the bared wire, thus completing the IED's circuit.

## COMMENT

The simplicity of this explosive device is frightening. It has no elaborate setups involving mercury switches, printed circuits, pressure-release mechanisms, or micro switches. It requires no special tools, components, or know-how to assemble. Yet, it could be just as effective as the most sophisticated IED in trapping an unwary technician. Likewise, its simplicity makes the device easily adaptable. Figure 2 shows that by inclining the inner pipe so that it rests in a parallel position when the outer pipe is elevated, just placing the IED flat will cause the battery to slide into contact with the copper wire contact. In Figure 3, two batteries are utilized. One ebc leg wire is connected to the positive terminal of the front battery; the other leg wire is connected to the second battery's negative terminal. Once the safety fuse is withdrawn, movement in either direction would cause the IED to function.

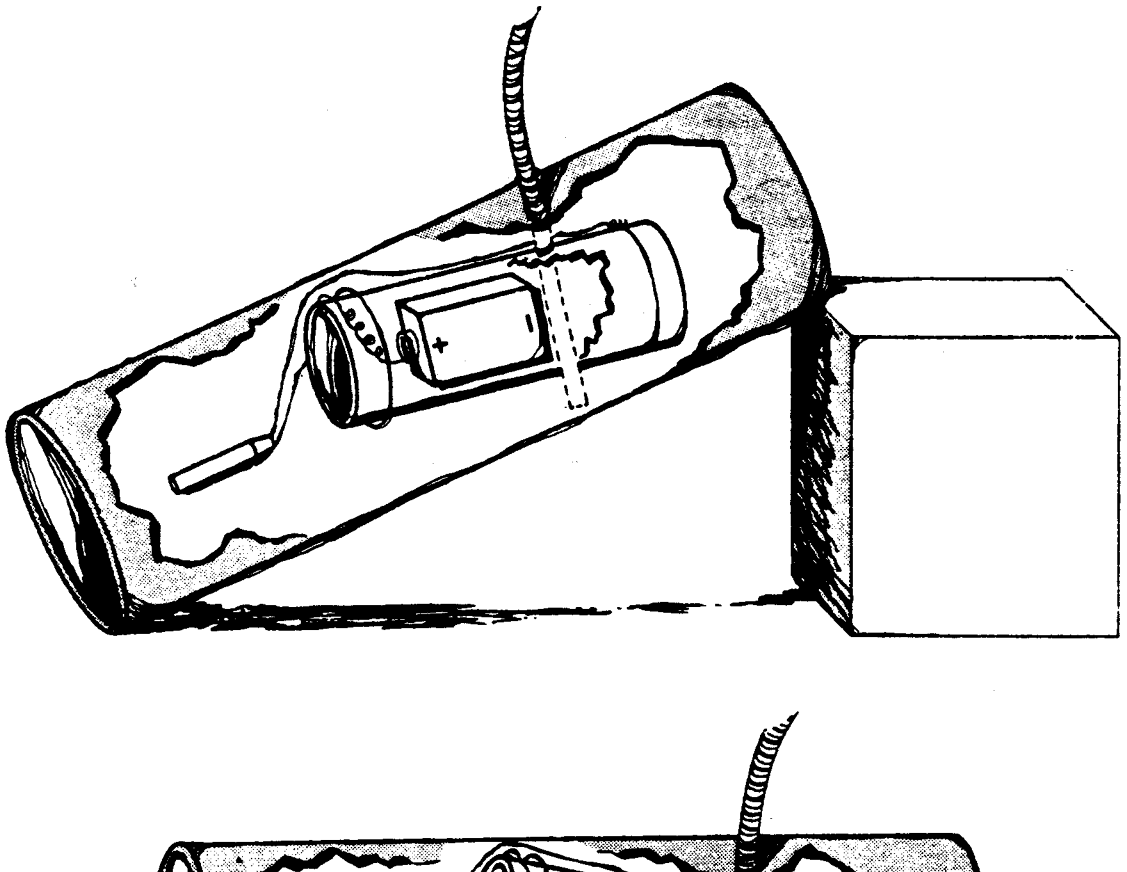


FIGURE 2

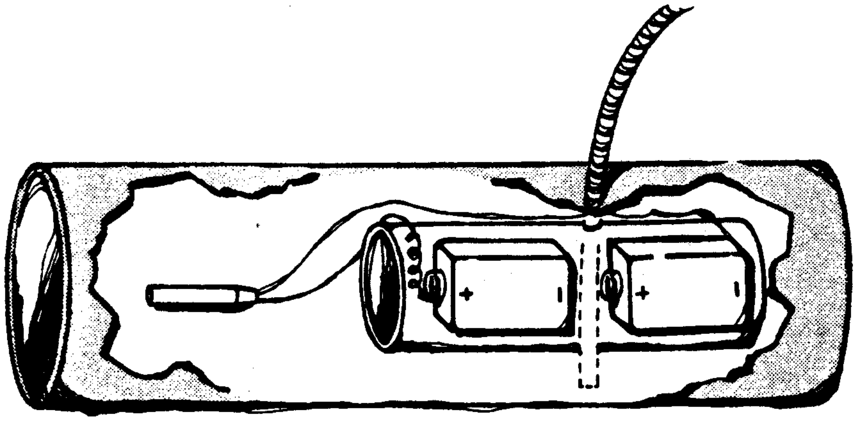
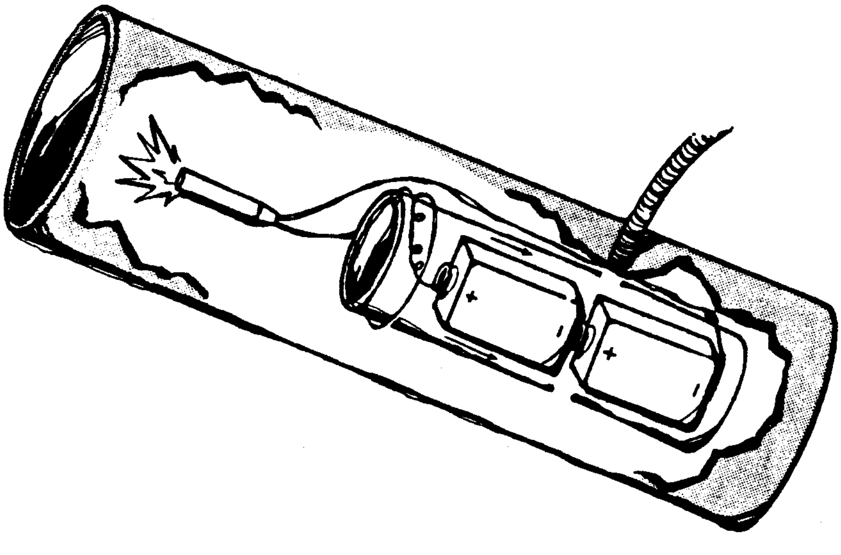


FIGURE 3



# TOOLS FOR THE BOMB TECHNICIAN

1. **Classification: Restricted Technical Data.**

2. **Subject: Suggested Tools for the Bomb Technician.**

3. **Source: Hazardous Devices School (HDS), Redstone Arsenal, Huntsville, Alabama.**

4. **Background:** The following lists have been provided by the Hazardous Devices School, Redstone Arsenal,to assist bomb teams in equipping their tool kits.

## TECHNICAL INFORMATION

**The items in each bomb technician's tool kit are a matter of personal preference. The tool lists provided in this bulletin are offered as guides for bomb disposal technicians. Varying conditions may warrant additions and deletions. Publication of items in this bulletin does not necessarily constitute an endorsement**

**Suggested Tools and Equipment for a Two-man Team:**

1. Exacto Knife/Scalpel and Assorted Blades.
2. Knife.
3. Small Lineman or Diagonal Wire Cutters.
4. Monofilament Tape.
5. Electrical Tape.
6. Treble Hook.
7. 2 Standard Flashlights - 2 Penlight Flashlights.
8. 500 Feet of Line (Minimum).
9. Cap Crimpers.
10. Wood Chisel.
11. Small Claw Hammer.
12. Explosives, Time Fuse, and Nonelectric Blasting Caps.
13. Stethoscope.
14. Dental Mirrors.
15. Assortment of Cotter Pins.
16. Hemostats.
17. Small Vise Grips.
18. Phillip's and Flat Tip Screwdriver.
19. Nonconductive Probes.
20. Shotgun or Gas Gun.
21. Water Pump Pliers.
22. Pipe Wrench.

**Optional Tools and Equipment for a Two-man Team Are Listed Below:**

Masking Tape
Duct Tape
Fish Hooks
14" Pinch Bar
Electrical Demolition Equipment
Doctor's Stethoscope
Zona Saw
Sandbags
Multi Tip Screwdriver
Pulleys
Magnets
Face Shield
Cap Protector (Pipe)
Pipe Wrench
Hack Saw with Assorted Blades
Bomb Trailer
X-Ray
FDE Blasting Machine, 10 Caps
Galvanometer
Firing Wiring, 500 Feet

**Suggested Tools and Equipment for a Three to Four-man Team:**

1. Remote Opening Tool.
2. X-Ray Equipment and Developer.
3. * 2 Cryogenic Units.
4. Remote Wire Cutters.
5. Body Armor.
6. Bomb Blankets.
7. Heavy Duty Vise.
8. Lead Wire for Firing Lines.
9. Camera.
10. Tape Recorder.
11. Volt - Ohm Meter.
12. Battery Tester.
13. Small Auxiliary Light System.
14. ** Assorted Hand Tools.
15. Listening Equipment (100 dollars plus).
16. Van Type Vehicle.
17. Portable Storage Area.
18. Demolition Area.
19. Duct Tape.
20. Wooden Wedges.
21. Bomb Trailer (either improvised or manufactured).

**Optional Tools and Equipment Are Listed Below:**

Evidence Collection Kit (Small)
Metal Detector.
Shovels, Hoes, and Rakes; i.e., Post Blast Tools.

**Suggested Tools and Equipment for a Team of Five or More Persons:**

1. Electronic Explosive Detector.
2. No. 3 and 4 Cryogenic Units.
3. Video Recorder System.
4. Large Auxiliary Lighting System.
5. Enough Back Up Tools and Spares To Equip 2 To 3 Two-person Teams.
6. Heavy Duty Truck.
7. Second Van Type Vehicle.
8. Bomb Sled.
9. Bomb Trailer.

* 2 large or 1 large and 1 small Cryogenics Unit.

** At least two sets of hand tools.

**Optional Equipment:**

Permanent Type Bunker in Demolition Area.

# UNUSUAL FUZING

1. **Classification:** **Restricted Technical Data.**

2. **Subject:** **Unusual Fuzing.**

3. **Source:** **Foreign.**
   **Domestic.**

## INTRODUCTION

During there was an average of over 130 bombings per month. The majority of the improvised explosive devices (IED) used in these incidents utilized some variation of the basic nonelectrical delay fusing system as a means of initiation. Similarly, of the approximately 172 IED recovered in the United States in the largest number employed simple initiation systems. It is inevitable, though, that each year out of the thousands of bombings and recoveries, some devices with elaborate or out of the ordinary fuzing systems will be encountered. Five such explosive devices are presented in this bulletin.

## TECHNICAL INFORMATION

*Incident No. 1:* The explosive device depicted in Figure 1 was discovered by the driver of a fuel delivery vehicle. It had been placed beneath the main shutoff valve of a gasoline storage tank, which was one in a group of six tanks. The storage tanks, with capacities of 7,000 to 13,000 gallons, contained gasoline and diesel fuel.

Upon approaching the suspicious package, the driver picked it up and carried it approximately 100 feet to an open area. Police responded to the scene and, while awaiting the arrival of a military explosive ordnance disposal (EOD) team, evacuated the area.

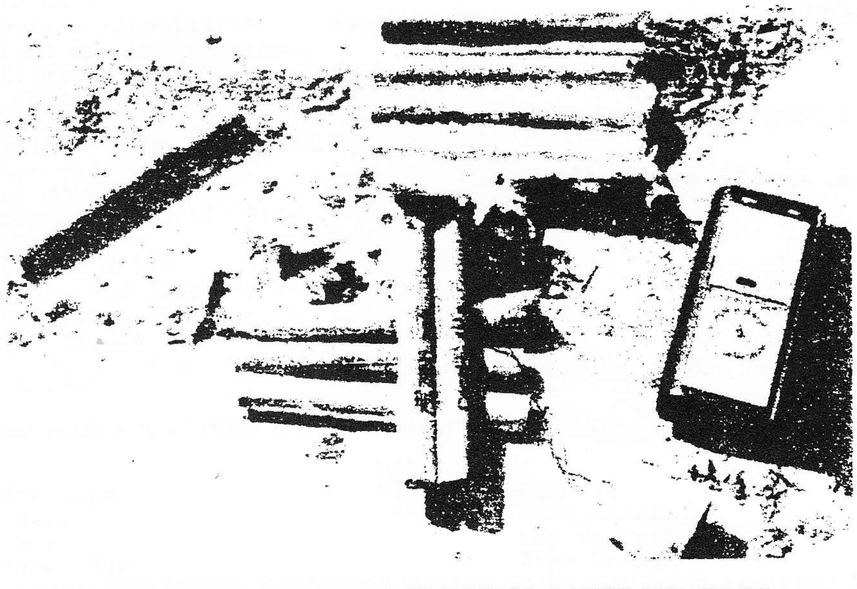


FIGURE 1: DEVICE DESCRIBED IN INCIDENT NO. 1 AFTER DISMANTLING

Placement of the IED in a bomb transport trailer was accomplished by remote means. The device was then removed to a safe area, where it was dismantled from behind a blast shield using remote handling tools.

Yellow plastic, similar to a plastic trash bag, completely enclosed the bomb's components. Masking tape secured this covering. The explosive charge consisted of 12 sticks of 70% dynamite which were encased in plaster of Paris. A number of 1 1/4 inch finishing nails had been imbedded in the plaster, and green paper toweling was used to wrap the entire conglomeration. One electric blasting cap had been inserted into a stick of dynamite, with two other caps placed between sticks in the dynamite bundle. Electric current for the IED was supplied by a 9 volt Mallory dry cell battery covered with masking tape.

The delay mechanism for this explosive device was an Admiral travel clock radio. See Figure 2. Although the radio portion was battery operated, the clock itself was run by a hand wound mainspring. Through a series of mechanical linkages, the clock was able to complete the appropriate electrical circuits to carry out any preset clock radio functions.

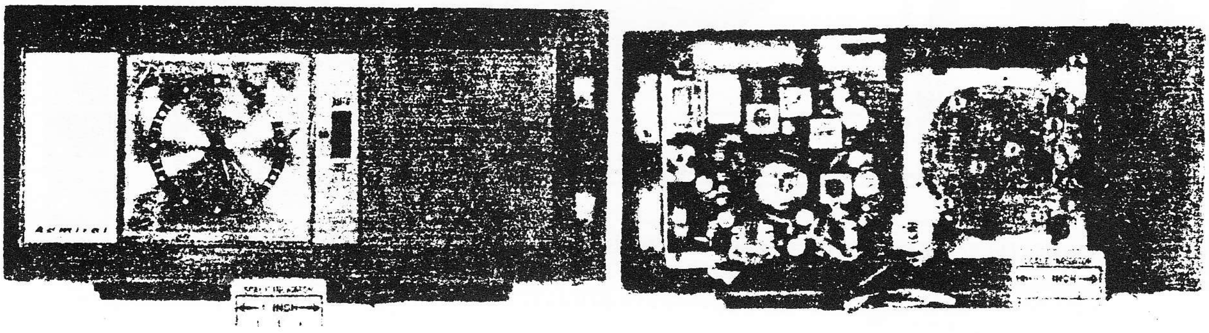


FIGURE 2: FRONT AND BACK VIEWS OF CLOCK RADIO USED AS DELAY MECHANISM

Normally, for the radio to function, the ON/OFF/AUTO switch would have to be either in the ON or AUTO position. The SLEEP timer knob (upper left portion of clock face) shut off the radio after any period of time up to 60 minutes. At the lower left corner is the ALARM switch, which turns the radio on at a predetermined time. Both the ALARM and SLEEP timer switches operate only in the AUTO position. Each operates independently.

When the device was dismantled, it was established that the clock had passed the ALARM setting and that both the ALARM and SLEEP timer controls were in the OFF position. The wires to the ON/OFF/AUTO switch had been severed at two points and were reconnected as follows: from one of two ALARM switch terminals to one leg wire of the series-joined blasting caps; and from the other alarm terminal through the 6 volt battery to the single blasting cap. Figure 3 illustrates where the cuts were made. Had the ALARM control been turned to ON, the IED would have functioned as the preset time was reached. If the SLEEP timer had been rotated from the OFF position, the device would have functioned instantaneously.

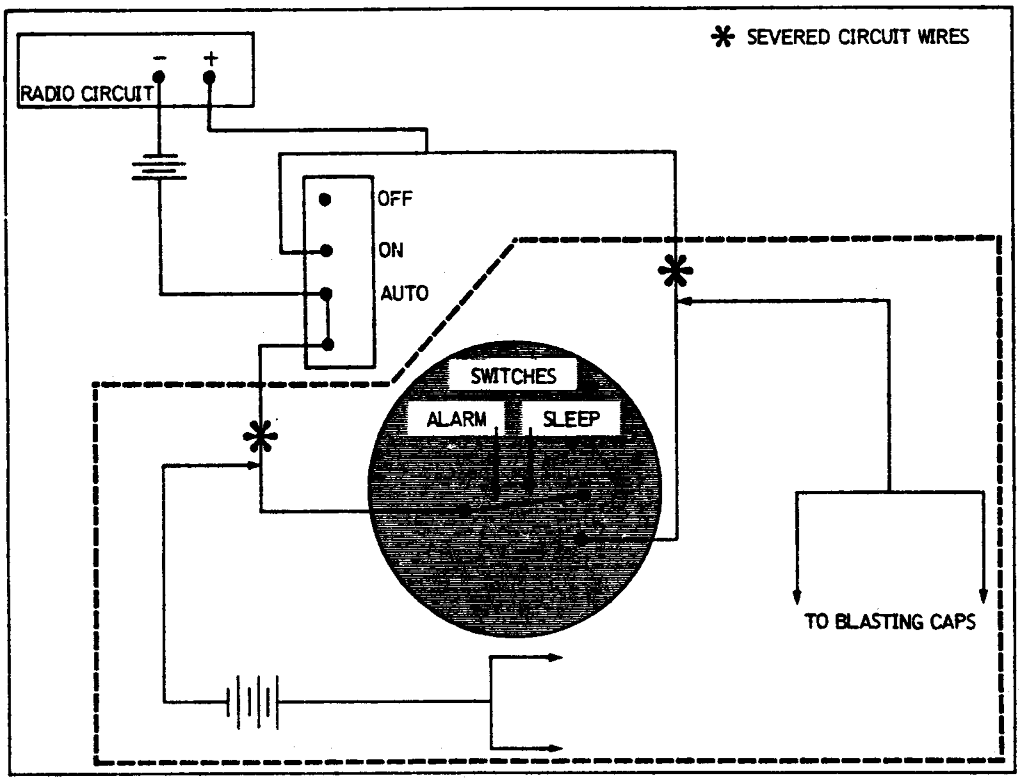


FIGURE 3: SCHEMATIC DIAGRAM SHOWING WHERE IED CIRCUIT WAS CUT TO ATTACH BLASTING CAP LEG WIRES

*Incident No. 2:* Explosive devices utilizing a novel method of initiation were encountered by foreign participants. The mechanical delay for these devices was provided by shutter release assemblies normally found in cameras.

A 320 gram mixture of picric acid/potassium chlorate contained in a stainless steel vessel served as the main explosive charge. Secured on top of the vessel was a close fitting lid secured with self-tapping screws. The delay mechanism was mounted atop the lid. See Figure 4. Fastened inside the lid, in a piece of plastic bag, was a small metal cylinder holding a Phillips flashbulb buried in a booster charge of 40 grams of the picric acid/potassium chlorate mixture. (Figure 4.) The power source, a 9 volt Ray-O-Vac transistor battery, was situated beside the booster charge.

The shutter release assembly mounted on the lid has a maximum delay of approximately 14 seconds. Mounted on a frame inside the lid was a small push button switch. See Figure 5. Upon expiration of the delay period, a prong attached to the shutter release mechanism would depress the push button switch completing the electrical circuit.

*Incident No. 3:* The same agency reported an attempt to trap policemen investigating what appeared to be a crashed, stolen car. The circumstances of the theft and crash were such that an EOD technician was called in to clear the vehicle. On the rear seat was a jacket which partially covered a .22 caliber rifle. More importantly, though, it was ascertained that the jacket completely concealed an IED which was rigged in such a manner that moving the rifle would have triggered the device's collapsing circuit initiating system.

The filler consisted of three pounds of explosive in a plastic bag. Two short delay electric detonators were utilized, along with two 9 volt batteries (one for the decay circuit and one for the firing circuit). As shown in Figure 6, the remainder of the device was comprised of a 60 minute timer (for delayed arming), a ON/OFF arming switch, a flashlight bulb (test bulb), and an electromagnetic relay (activating switch). A 6 1/2 inch x 4 1/2 inch x 2 1/2 inch compartmented wooden box housed the circuitry.

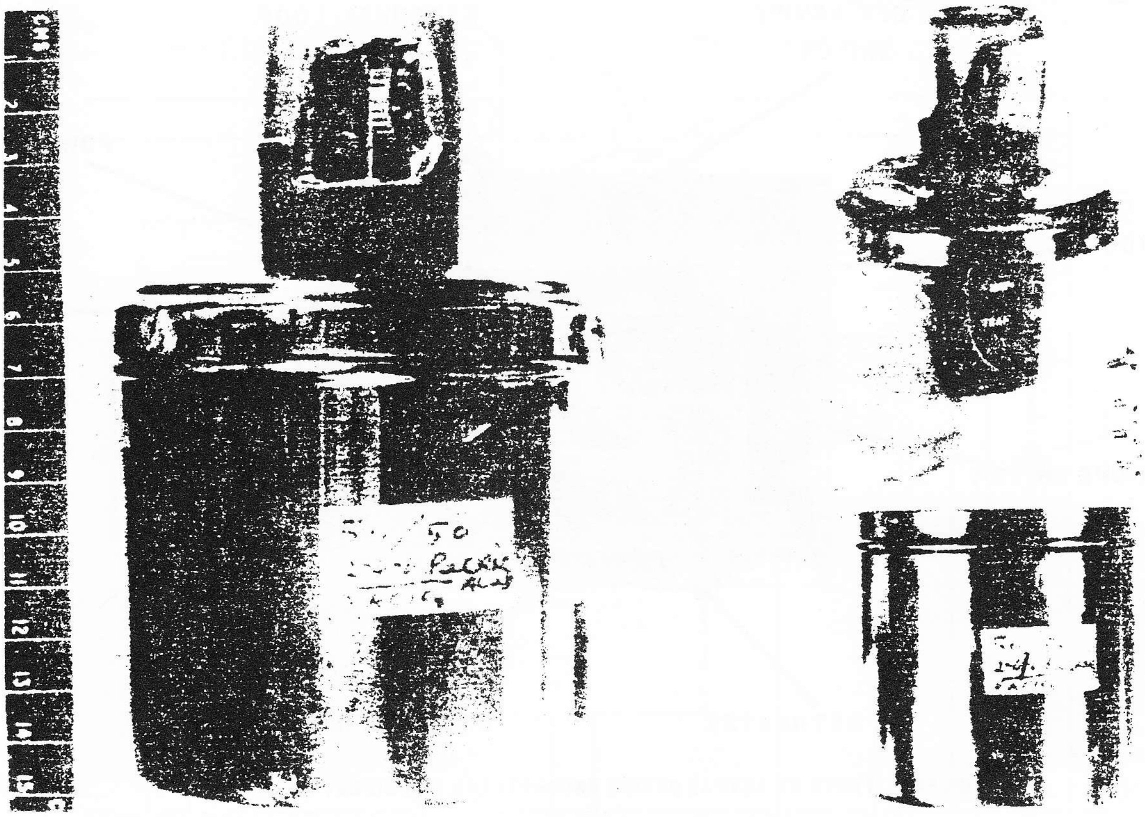


FIGURE 4: LEFT; SHUTTER RELEASE MECHANISM ON TOP OF IED
RIGHT; BATTERY AND EXPLOSIVE ATTACHED TO UNDERSIDE OF LID

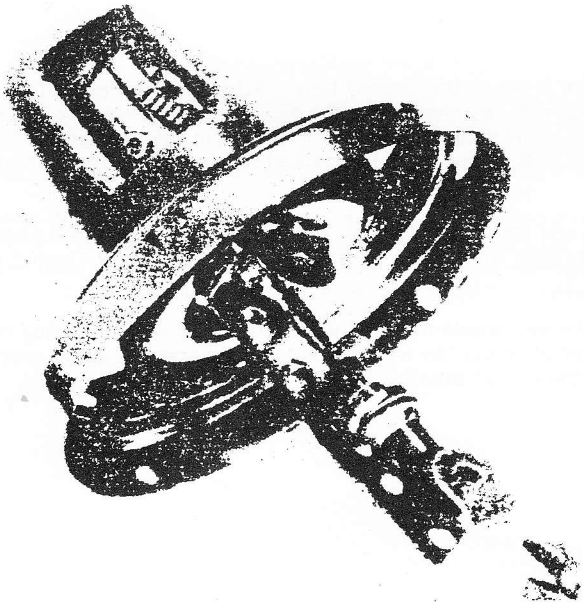


FIGURE 5: BOTTOM OF ASSEMBLY WITH PUSH BUTTON SWITCH
POSITIONED BENEATH METAL PRONG FROM SHUTTER RELEASE ASSEMBLY

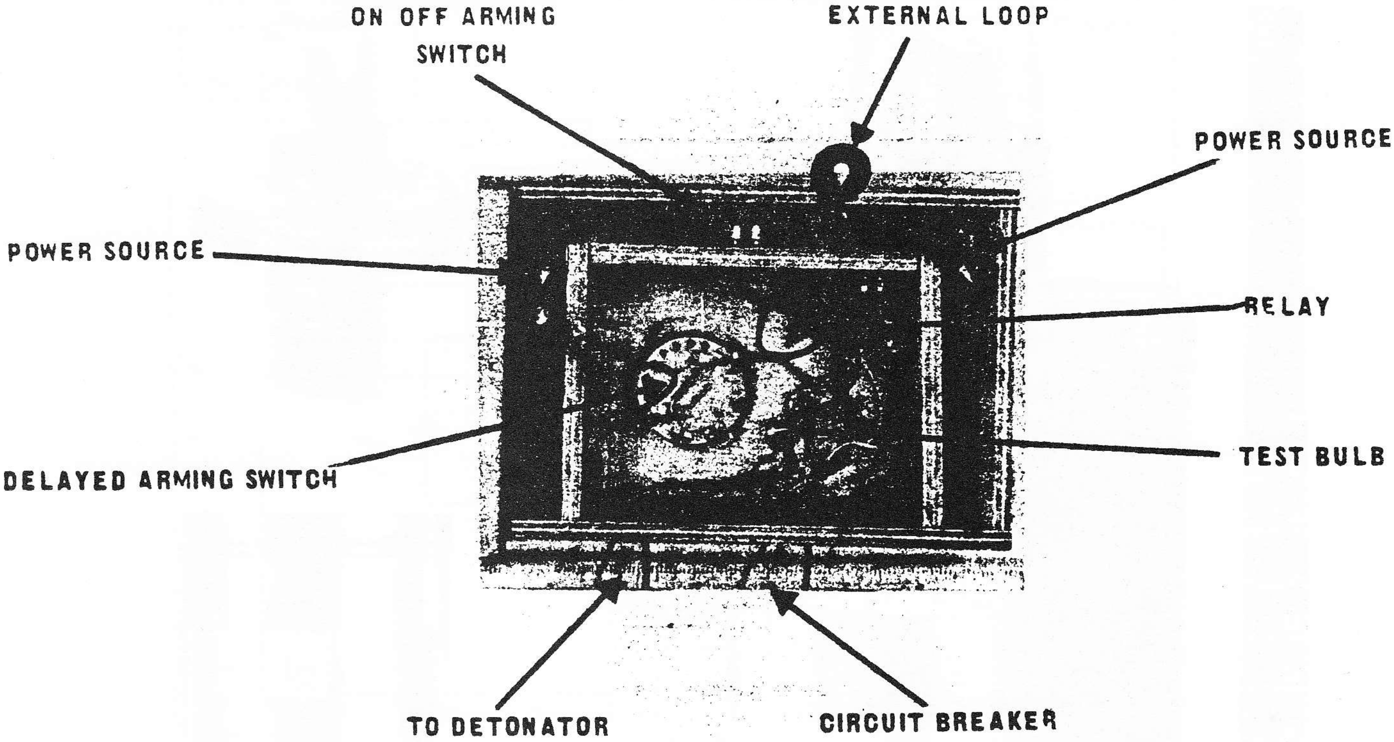


FIGURE 6: PHOTO OF ACTUAL DEVICE ENCOUNTERED IN INCIDENT NO. 3

Passing through one side of the box was a 2 inch wire loop used in testing the device's electrical circuitry. Two pairs of wires passed through the opposite side of the box. One pair was connected to the detonators; the other pair formed the circuit breaker.

To arm this IED, the delay mechanism is set at the desired time. After testing the continuity of the electric circuit through the timer, the external loop is cut. By connecting the circuit breaker wires to the rifle barrel the circuit to the activating switch is completed. This causes the relay to be held in the open position (which in turn interrupts the firing circuit). Completion of the arming sequence is attained by connecting the terminals and placing the arming switch in the ON position.

If contact between the circuit wires and the rifle is broken, the interrupted circuit will allow the activating switch (relay) to close. Providing that the arming time delay has expired, the firing circuit would then be completed the instant the relay closed. See Figure 7.

This device, if not discovered or destroyed, would function when the power source holding the relay open lost its charge—a decaying circuit. Any attempt to cut the wires by untrained personnel could produce the same result as separation of the rifle barrel and the circuit breaker wires.

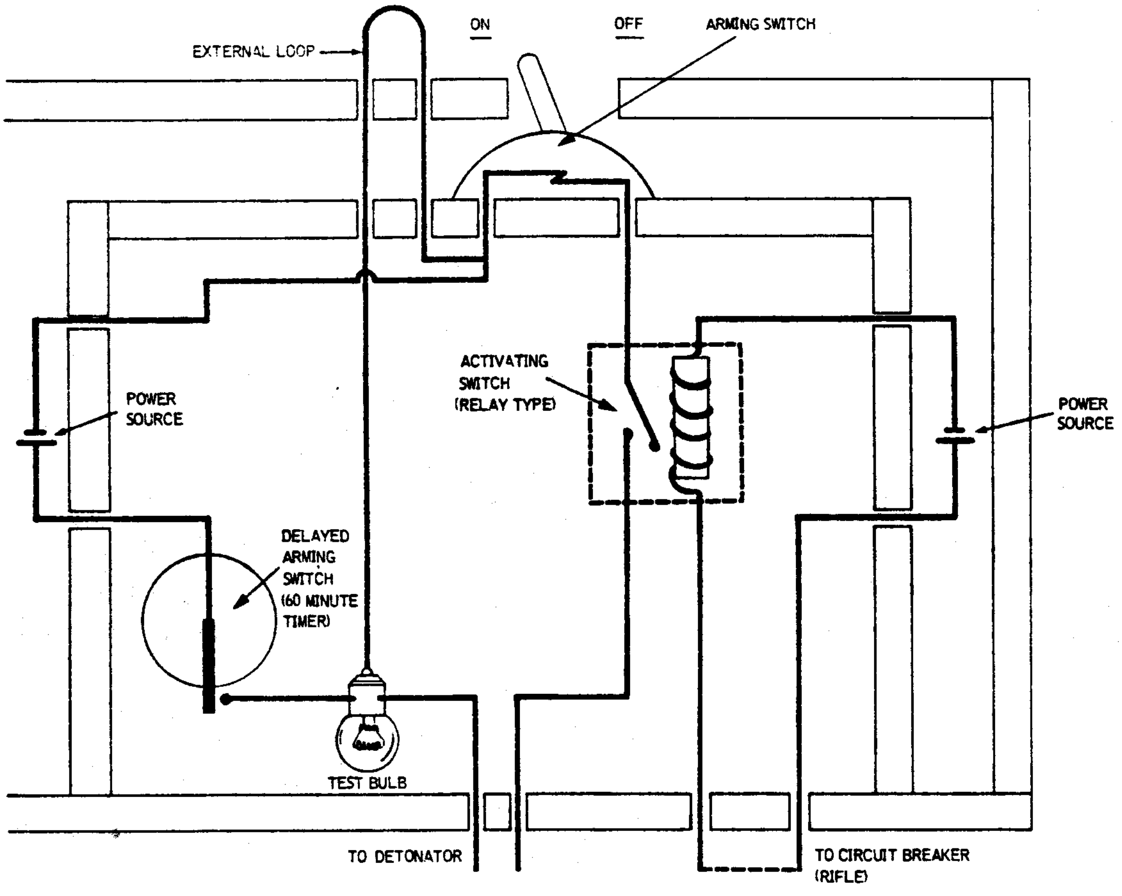

EXTERNAL LOOP
ON
OFF
ARMING SWITCH
POWER SOURCE
ACTIVATING SWITCH (RELAY TYPE)
POWER SOURCE
DELAYED ARMING SWITCH (60 MINUTE TIMER)
TEST BULB
TO DETONATOR
TO CIRCUIT BREAKER (RIFLE)

**FIGURE 7: SCHEMATIC DIAGRAM OF DEVICE SHOWING DELAY AND DECAY CIRCUITS**

*Incident No. 4:* Because of suspicious circumstances surrounding the discovery of a stolen car, officials searched the car for possible booby-trapped IED. The area in which the vehicle had been located was also checked for booby traps or command operated explosive devices. In spite of these precautions an explosion occurred as the car was being moved. The policeman driving the car was killed and five other individuals were injured.

This pressure release explosive device had apparently been meticulously buried and further concealed by situating one of the car tires on top of it. Two large milk cans were used as containers for the device, and the explosive charge was estimated to have been 200 to 500 pounds of ANFO. A plunger mechanism housed in a wooden frame acted as the pressure release switch. The frame was a simple four-sided box measuring 5 inches x 3 1/2 inches x 2 1/2 inches.

A slot was cut in the top of the frame. Attached to the underside of this slotted board was a piece of tin with a matching slot. The tin served as one contact and was held in place by four screws, which also held the frame together. A soft wooden plunger was then fitted through the slot at right angles to the top and bottom of the frame. See Figure 8.

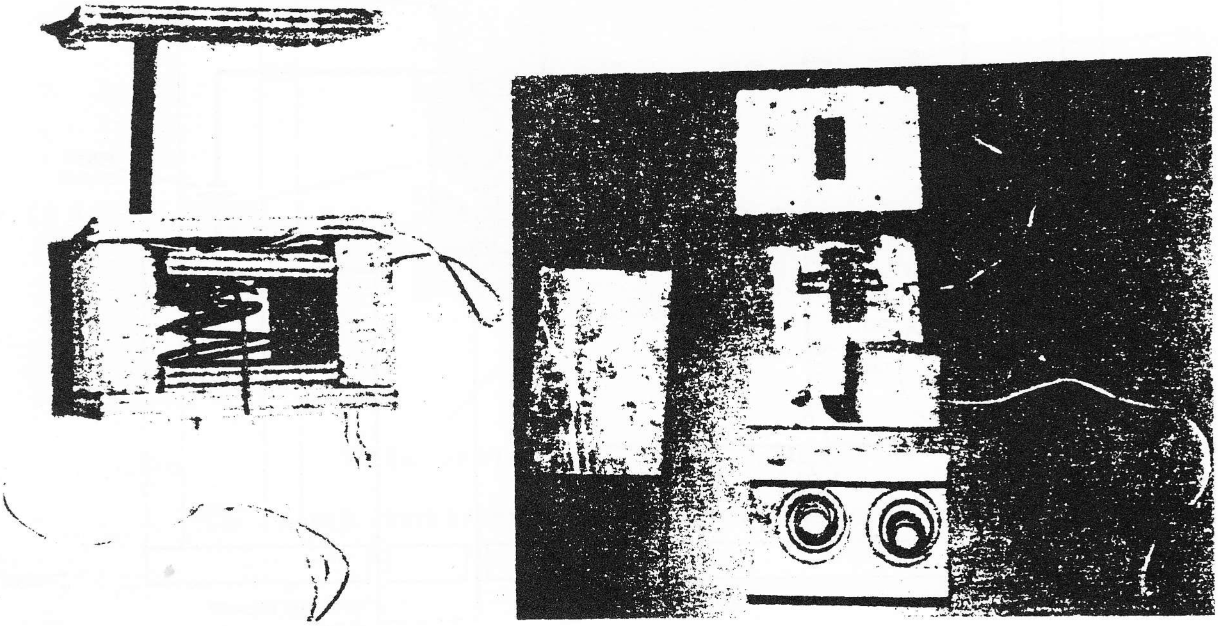


**FIGURE 8: LEFT; PRESSURE RELEASE PLUNGER MECHANISM IN FIRED POSITION. RIGHT; COMPONENTS OF DEVICE DESCRIBED IN INCIDENT NO. 4**

Mounted within the frame were two conical springs (similar to mattress springs). A piece of plywood was fastened atop the springs. On the upper surface of this plywood platform were two copper discs which together served as the second contact. The plunger and platform were fastened to one another with screws.

By parking the vehicle with one tire on the plunger, the plywood platform compressed the springs, which separated the contacts. (Electrical leads from the contacts were wired into the IED's circuit.) Moving the car would enable the springs to force the plunger and plywood platform upward, ultimately allowing the tin plate and the copper discs to make contact, thus completing the circuit. (Refer to Figure 8.)

*Incident No. 5:* Small incendiary devices with delay initiating systems are popular among terrorists in some countries overseas. The devices basically consist of a watch with only its hour hand and a gas igniter element. One of the more popular containers has been the small plastic case in which cassette tape cartridges are stored. See Figure 9.

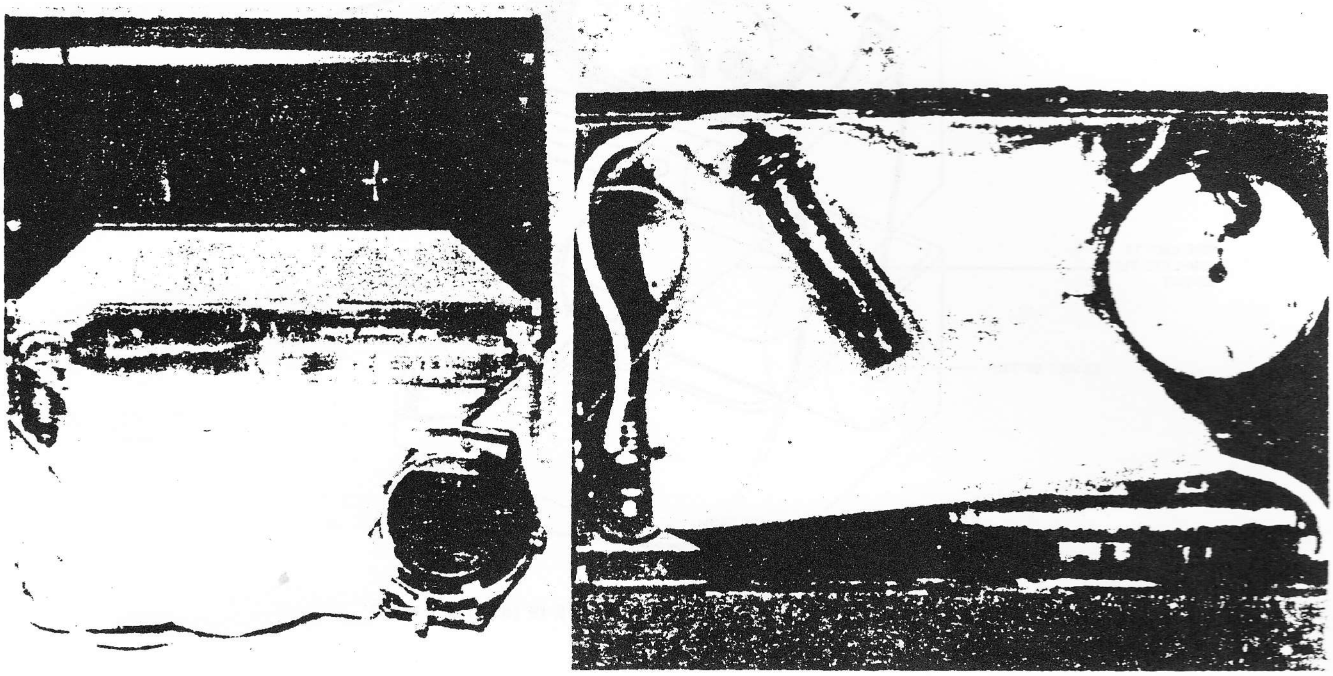


FIGURE 9: TWO VIEWS OF SMALL INCENDIARY DEVICE CONTAINED IN PLASTIC CASSETTE TAPE CASE

Earlier types consisted of a watch with a contact pin inserted through its face, a 1½ volt battery, an element from a battery powered gas lighter, and a quantity of chlorate, sugar, and oil. The gas lighter element serves as the igniter and it is inserted into the incendiary charge. To check the arming of the time delay mechanism, a flashlight bulb is included. These components are assembled and placed inside the container.

A recent recovery of four incendiary devices reflected a dual modification in the assembly procedure. Utilizing containers with clear plastic lids (Figure 10), holes were made in the bottom and side so the base of the test bulb and a wire (B) would protrude. The other change involved taping the watch to the outside of the container. Apparently introduced to facilitate handling by an untrained bomber, these modifications make a battery check and arming of the timing mechanism a simple task. Both can be performed without opening the container.

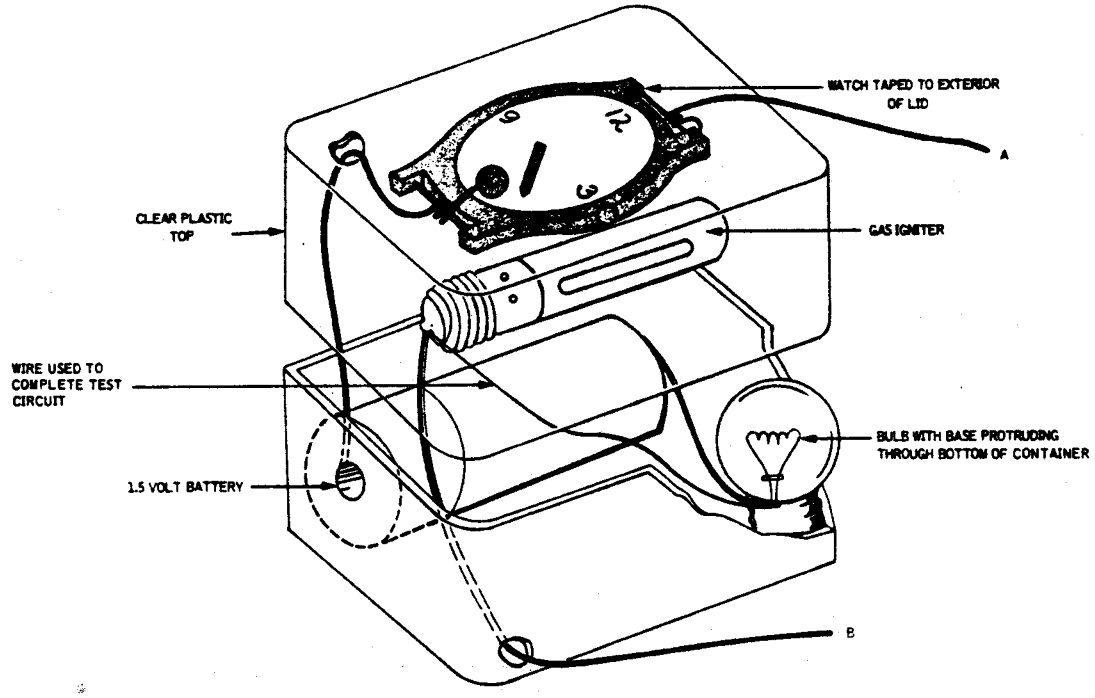
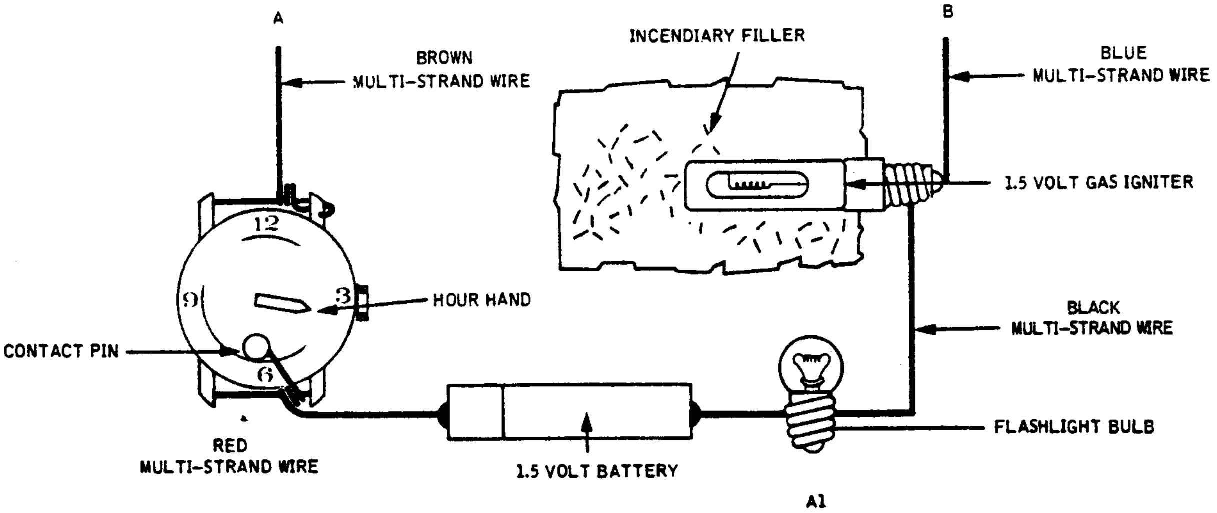

WATCH TAPED TO EXTERIOR OF LID
9
12
3
A
CLEAR PLASTIC TOP
GAS IGNITER
WIRE USED TO COMPLETE TEST CIRCUIT
BULB WITH BASE PROTRUDING THROUGH BOTTOM OF CONTAINER
1.5 VOLT BATTERY
B

FIGURE 10: GENERAL DESIGN OF INCENDIARY DEVICE IN INCIDENT NO. 5



BULB LIGHTS WHEN WIRE A IS TOUCHED ON A1.

TO ARM – MOVE HAND TO GIVE REQUIRED DELAY.
JOIN WIRES A AND B.

FIGURE 11: BASIC CIRCUIT DIAGRAM OF SMALL INCENDIARY DEVICE

As shown in Figures 10 & 11, a battery or circuit test can be executed simply by touching a wire (A) to the base of the test bulb. This wire leads to the watch. With the hour hand against the contact pin and wire A placed against the base of the bulb, the bulb will be seen to light if the battery and circuit are working properly. When the hour hand is set at the required delay, the bulb will go out. Wire A is then connected to wire B (from the initiator) which protrudes through the bottom of the container.

A disadvantage from the bomber's point of view is that although this design simplifies handling of the device, it makes the circuitry much easier to detect during a cursory search.

# U.S. BOMBINGS

## BOMBINGS IN DIFFERENT PARTS OF THE COUNTRY

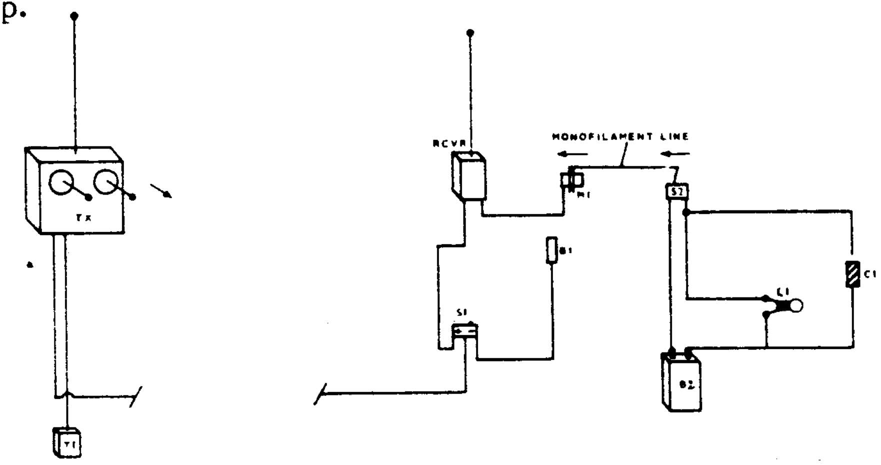
SOURCE: Domestic.

One bombing incident that was narrowly avoided in March and another that occurred in April, prompted this FBI Bomb Data Center (BDC) bulletin. In the former case, a radio controlled improvised explosive device (IED) was stumbled upon and detected by an innocent citizen, whereas in the latter case, a delay type of improvised incendiary device was used to destroy an empty, parked car.

## BOMB IS FOUND IN TRASH CAN

A possible tragedy was avoided in San Diego, California, when a citizen accidentally located an IED and a model airplane radio transmitter in a canvas bag inside a garbage can.

The remote controlled IED, had it been operative, would have functioned as follows: When the receiver picked up the signal from the transmitter, the servo-motor would turn, pulling on the mono-filament fishline, thus closing the firing switch and exploding the bomb. As a safety precaution, the blasting cap wires were disconnected and a light was wired in parallel with the circuit. If the light was on, it was a warning not to hook up the blasting cap.



**TX** - **MODEL AIRPLANE TRANSMITTER**
**T1** - **AC ADAPTOR FOR CHARGING NICAD BATTERIES IN TX AND RCVR**
**B1** - **BATTERY FOR RECEIVER**
**M1** - **SERVO MOTOR**
**S2** - **ON/OFF SWITCH FOR C1 AND L1**
**B2** - **6-VOLT BATTERY**
**L1** - **LIGHT**
**C1** - **BLASTING CAP**

FIGURE I: REMOVE CONTROLLED EXPLOSIVE DEVICE – SCHEMATIC

## CAR BOMBING AT AIRPORT

On Sunday, April 9 a car burst into flames while parked in a lot at Washington National Airport, Alexandria, Virginia. After extinguishing the flames, the Federal Aviation Administration (FAA) Fire Department noticed a battery and a timer on the right front floor board of the car. Upon discovery, the FAA sent for a special team from the local police.

Having concluded that the fire was completely extinguished, one of the officers approached the car to do an initial search. Found on the front right floor board of the car was the improvised incendiary device (IID), which in this case was constructed using a 12 volt motorcycle battery and a common kitchen timer to initiate the gasoline soaked interior of the automobile. Wires connected to the battery and timer were out of sight underneath and behind the battery. Figure 3 is an actual photograph of the clock delay type of incendiary mechanism just described.

The IID functioned when electron flow from the battery passed through the timing mechanism and associated wiring, thereby heating a small bridgewire (.020) and igniting a combustible composition of gasoline vapors.

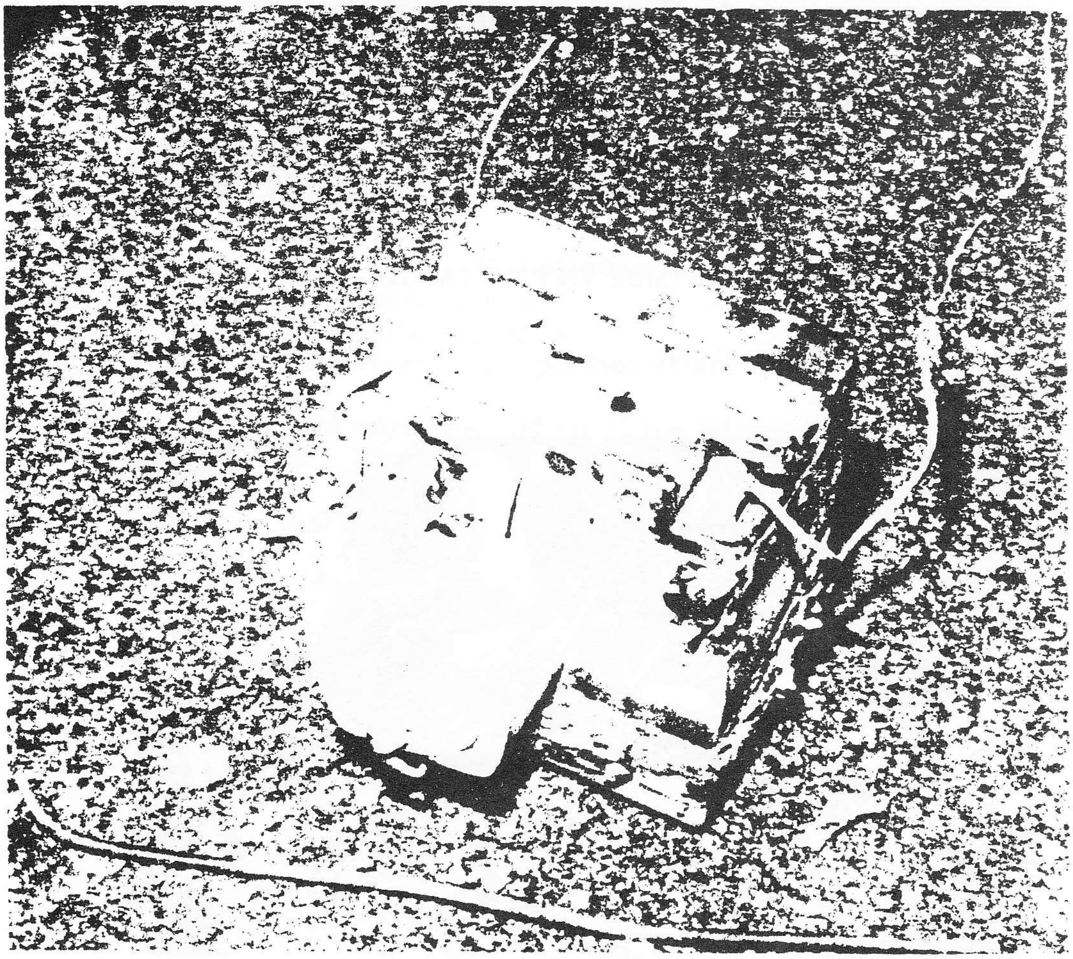


FIGURE 3: INCENDIARY DEVICE

## DISMANTLING THE DEVICE

Once the officer had surveyed the situation, he made an attempt to disrupt the circuit by cutting the wires connected to the battery by using the bomb circuit cutter. Even though the wire was approximately 16 gauge, the insulator was too thick to allow the cutter to be utilized. It was decided to remotely remove the battery and timer assembly from the vehicle by means of a rope. Once this task had been completed, an investigation of the device revealed that it had in fact functioned and was now safe. Vehicles near the burned car itself were checked for other devices. No other devices were found. Figure 4 denotes an outside view of the car with the incendiary device just to the right of the automobile. Figure 5 is an illustration of the approximately $6,000 damage done to the inside of the car.

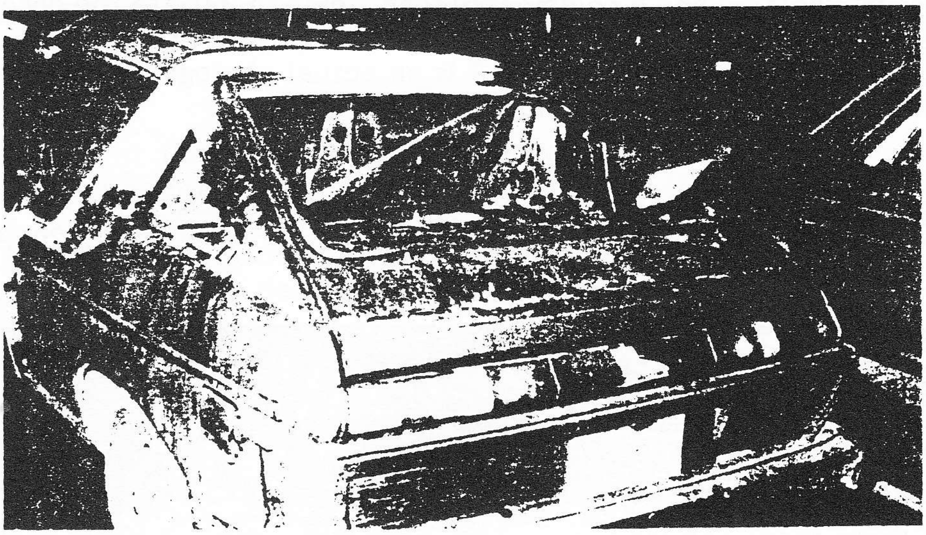


FIGURE 4: OUTSIDE VIEW OF TARGET CAR

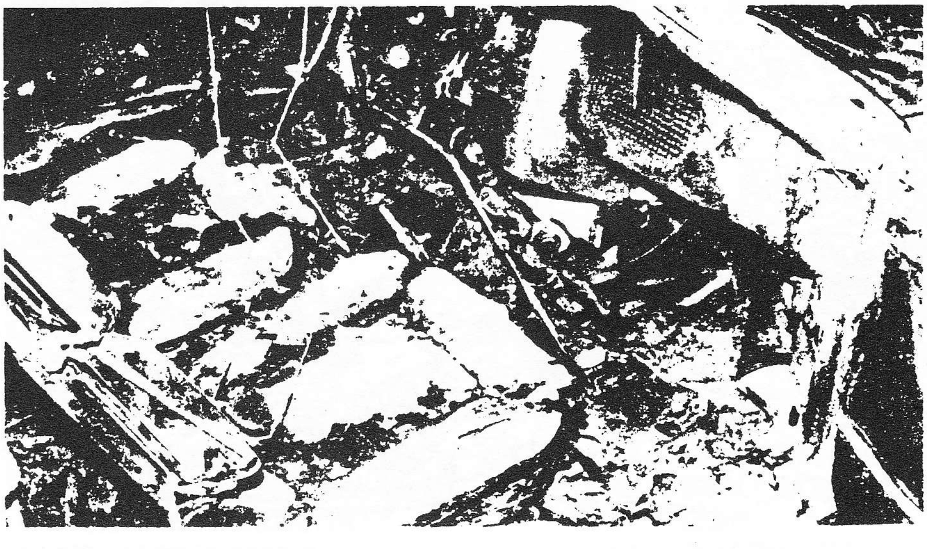


FIGURE 5: EXPLOSION DAMAGE

# WEAPONS SMUGGLING

**WEAPONS SMUGGLING**
**SOURCE: Foreign.**

Two incidents that involved the smuggling of weapons into a foreign country precipitated this Bomb Data Center (BDC) bulletin. Both incidents, one that was perpetrated by members of a terrorist organization and the other that was attempted by a United Nations officer were aborted by the foreign power. The contraband confiscated will be described herein.

On April 15, , a detail of four terrorists penetrated the border of another country. In an encounter with a unit of a local defense force, all four of the terrorists were killed. The following arms and equipment were found on the terrorists:

4 G-3 rifles with bayonets
10 rifle grenades
18 hand grenades
10 demolition blocks in 3 packets, with 3 standard detonators
4 sets of personal equipment and 2 packs
A Fatah flag with the inscription "Group 14"
Pamphlets explaining the purpose of the planned attack

Two of the four G-3 rifles were new and all of the rifles were determined to be in perfect mechanical order. The grip on the rifles was of a new design, in addition to the folded butt made out of steel. The grip is wider than that used for the previous weapons of this type, and this makes it easier to hold, especially during automatic fire.

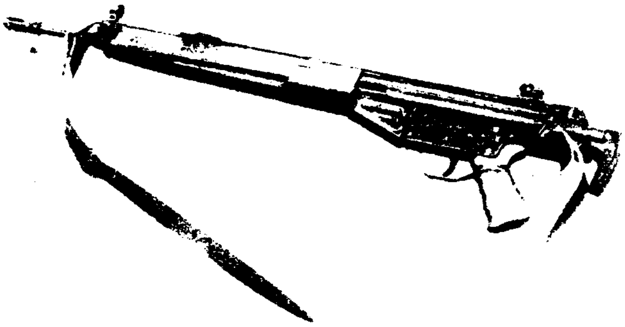


FIGURE 1: RIFLE

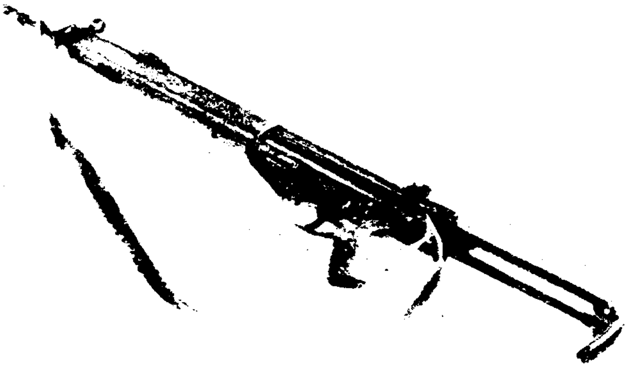


FIGURE 2: RIFLE

Six out of twelve ammunition magazines were loaded with a cartridge blank on top. This enables the guerrillas free movement with a loaded rifle, or with a grenade (anti-armor, anti-personnel) fixed on the rifle launcher. Regular fire can be initiated by removing the grenade and cocking it (to remove the cartridge blank), without having to replace the magazine.

### SMUGGLING OF WEAPONS BY A UNO OFFICER

On June 5, a routine check was carried out after an automobile accident involving a United Nations Organization (UNO) vehicle. This search revealed two suitcases with various weapons and ammunition. The subsequent interrogation of the subject established the fact that he had carried the suitcases on a mission for terrorist organizations.

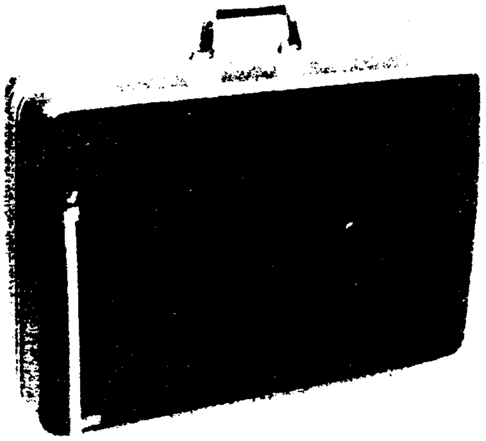


FIGURE 3: SUITCASE

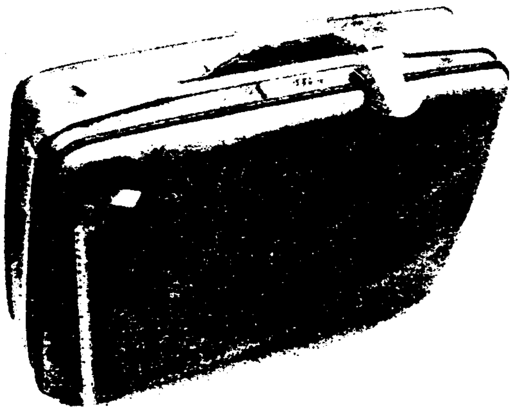


FIGURE 4

The following explosives were confiscated:

18 demolition blocks M-112, made in the USA. These blocks contain high explosives of the RDX type.

10 demolition blocks of U.S. manufacture. These blocks contain high explosives of the TNT type.

77 plastic dynamite sticks - each plastic stick contained a mixture of high explosives, nitroglycerin and ethylene glycol dinitrate.

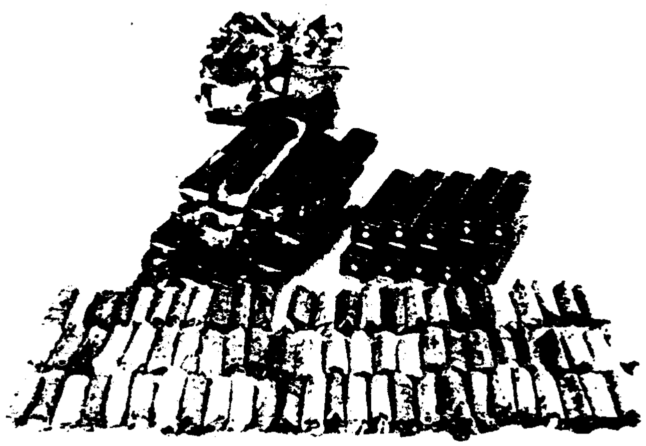


FIGURE 5: DEMOLITION BLOCKS

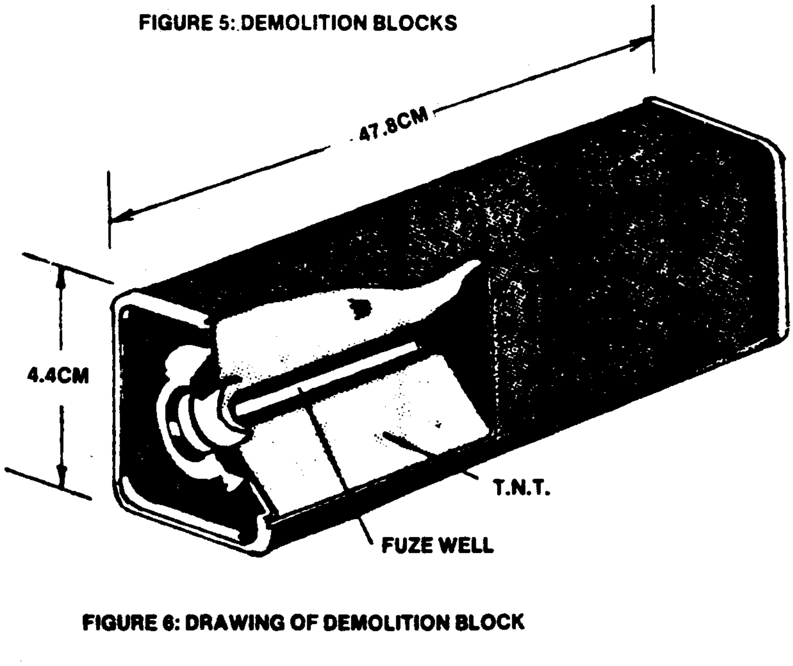


FIGURE 6: DRAWING OF DEMOLITION BLOCK

Detonators recovered are listed below:

60 electrical detonators, of two principal types:
a) Immediate explosion - marked O/Z (manufacturer's designation code).
b) Delayed action - these are longer detonators, marked on the base with the letter "T" with a digit, which is the manufacturer's code for the length of delay.

The detonators marked O/Z are known to be manufactured in the Eastern bloc.

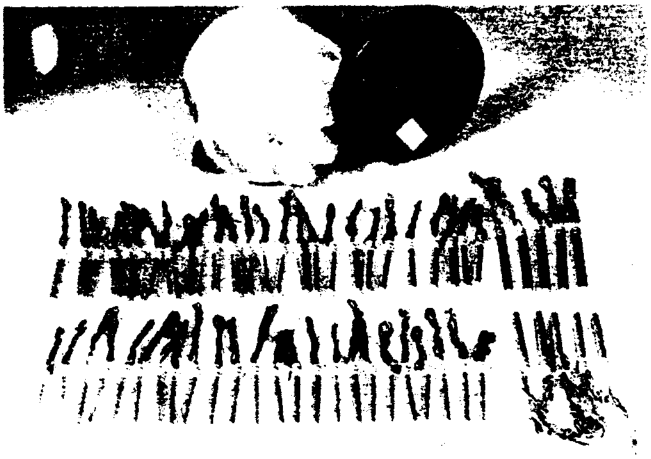


FIGURE 7: DETONATORS

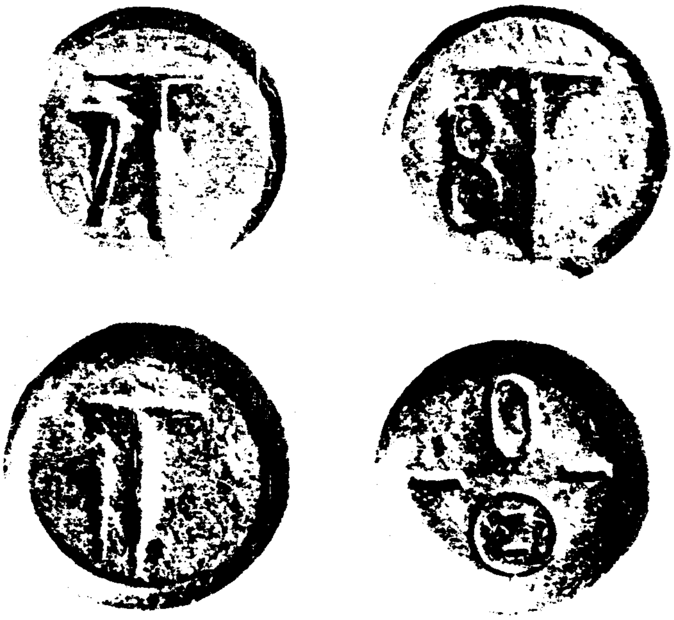


FIGURE 8: DETONATOR MARKINGS

**GRENADES RECOVERED**

The grenades recovered were the MK2 type. These grenades used to be manufactured in the U.S. until around The year of manufacture on the outside of the container though was The grenades were examined and it was found that they were externally identical with American grenades, but that the explosives inside the grenades were different. In American grenades the explosive used is "Composition B" (40% TNT and 60% RDX), whilst in the grenades seized, the filler used was TNT in flake form. Because of this discrepancy therefore, it appears that the grenades were not manufactured in the U.S., but rather are imitations of American Military ordnance.

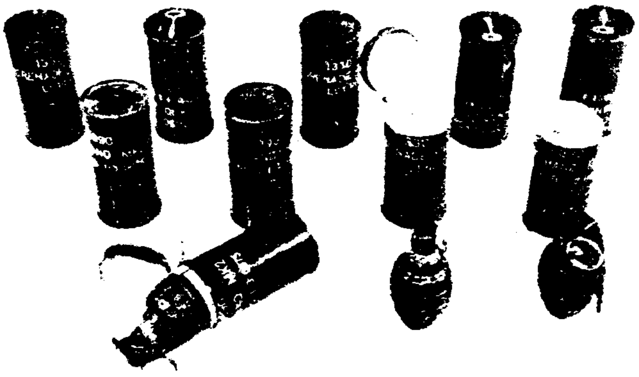


FIGURE 9: GRENADES

**GUNS SMUGGLED**

Also confiscated in the smuggling attempt were some small arms. A 7.62 MM AK-47 assault rifle made in Poland was recovered, along with two 9 MM "Beretta" Model 12 Parabellum sub-machineguns. These sub-machineguns are described below:

Manufacture - "Beretta" (Italy)
Calibre - 9 MM Parabellum
Action Principle - Recoil, no locking
Butt - Collapsible steel
Length - 64.5 inches; folded - 41.8 inches
Length of Barrel - 20 inches
Rear sights - two positions
Net weight - 3 kg.
Weight, loaded - 3.73 kg.

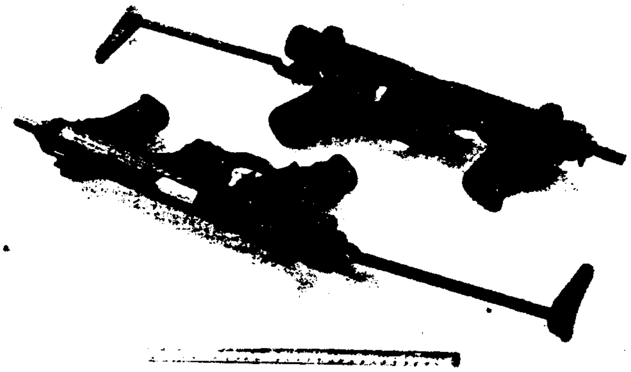


FIGURE 10: SUB-MACHINE GUNS

Would you like to know what the U.S. government knows about terrorist explosives? Well, ***Federal Bomb Intelligence*** represents thirty-five of the most notorious, sophisticated, or effective improvised explosive devices that have actually been built or used around the world. The information contained in these bulletins has been circulated to EOD specialists and counterterrorism experts within the government who are tasked with monitoring and/or preventing the use of bombs against the U.S. government, its citizens, or its property.

Detailed, nontechnical information and schematics show exactly how each device was constructed. In cases where the bombs were used, the reports describe how they were detonated and their impact. Instructions or suggestions for detection and defusion also accompany some devices. Highlights include the Lake Tahoe bomb (a 1,000-pound, supersophisticated bomb with thirty-four switches and leveling bubbles for stability); electronic delay circuits; short-duration timers; package bombs received by U.S. embassies; the latest car bombs used in Canada, Puerto Rico, and elsewhere; booby-trapped flight bags; solid-state timing devices; and much, much more. A lot of the information presented in this book has never been seen outside restricted circles!

Find out what your government knows about explosives but isn't telling you.

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